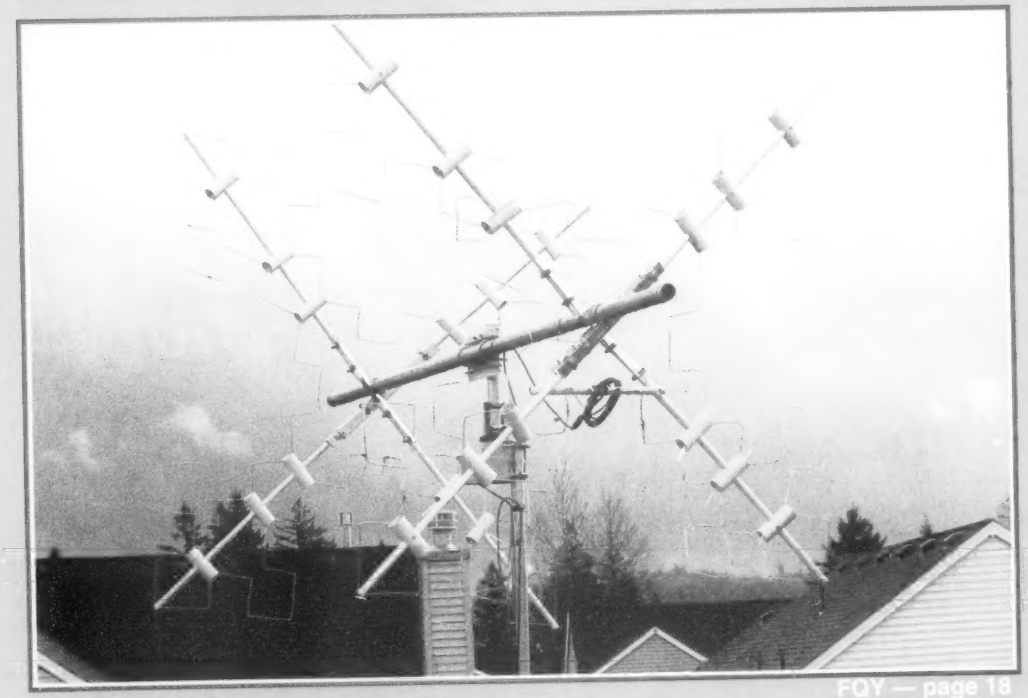
73 Amateur Radio Today

OCTOBER 1996
ISSUE #468
USA $3.95
CANADA $4.95

You Can Build:

TV Tuner → UHF Dipper
HT Porta-Power
Fractal Quad Yagi!



FQY — page 18

Plus:

The History of Ham Radio

10
**********5-DIGIT 48103
#00000191940WR5# JUN76
SERIALS PROCESSING DEPT
UNIV MICROFILMS IT
300 N ZEEB RD
ANN ARBOR MI 48103-1553

SYNTHESIZED VHF & UHF EXCITER & RECEIVER MODULES

Exciters and Receivers provide high quality nbfm and fsk operation. Features include:

- ***Dip switch frequency selection.***
- ***Exceptional modulation for voice and ctcss.***
- ***Very low noise synthesizer for repeater service.***
- ***Direct fm for data up to 9600 baud.***
- ***TCXO for tight frequency accuracy in wide range of environmental conditions.***
- ***Next day shipping. No wait for crystals.***

EXCITERS:

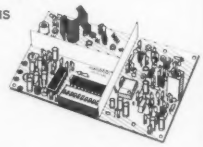
Rated for continuous duty, 2-3W output.

T301 VHF Exciter: for various bands 139-174MHz, 216-226 MHz.

- Kit (ham bands only) ...**$109** (TCXO option $40)
- Wired/tested, incl TCXO...**$189**

T304 UHF Exciter: various bands 400-470 MHz.

- Kit (440-450 ham band only) incl TCXO ...**$149**
- Wired/tested...**$189**



RECEIVERS:

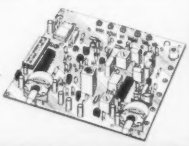
***Very sensitive** – 0.2µV.*
***Superb selectivity,** >100 dB down at ±12 kHz, best available anywhere, flutter-proof squelch.*

R301 VHF Receiver: various bands 139-174MHz, 216-226 MHz.

- **Kit** (ham bands only) ...**only $139** (TCXO option $40)
- **Wired/tested** ...**$209** (includes TCXO)

R304 UHF Receiver: various bands 400-470MHz.

- Kit (440-450 ham band only) incl TCXO ...**$179**
- Wired/tested...**$209**



TRADITIONAL CRYSTAL-CONTROLLED VHF & UHF FM EXCITERS & RECEIVERS

FM EXCITERS: 2W output, continuous duty.

- **TA51:** for 6M, 2M, 220 MHz ..... **kit $99, w/t $169**
- **TA451:** for 420-475 MHz. ..... **kit $99, w/t $169**
- **TA901:** for 902-928 MHz, (0.5W out) ..... **w/t $169**

VHF & UHF POWER AMPLIFIERS.

Output levels from 10W to 100W.....**Starting at $99**

FM RECEIVERS:

- **R100 VHF FM RCVR.** For 46-54, 72-76, 140-175, or 216-225 MHz. ..... **kit $129, w/t $189**
- **R144 RCVR.** Like R100, for 2M, with helical resonator in front end..... **kit $159, w/t $219**
- **R451 FM RCVR,** for 420-475 MHz. Similar to R100 above. kit $129, w/t $189.
- **R901 FM RCVR,** 902-928MHz ..... **$159, w/t $219**

TRANSMITTING & RECEIVING CONVERTERS

No need to spend thousands on new transceivers for each band!

- **Convert vhf and uhf signals to & from 10M.**
- Even if you don't have a 10M rig, you can pick up very good used xmtrs & rcvrs for next to nothing.
- Receiving converters (shown above) available for various segments of 6M, 2M, 220, and 432 MHz.
- Rcvg Conv Kits from $49, wired/tested units only $99.

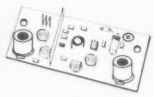
- **Transmitting converters for 2M, 432 MHz.**
- Kits only $89 vhf or $99 uhf.
- Power amplifiers up to 50W.

LOW NOISE RECEIVER PREAMPS

LNY-( ) ECONOMY PREAMP

NEW

ONLY $29/w&t



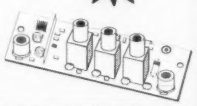
- Miniature MOSFET Preamp.
- Low noise figure.
- RCA jacks allow easy connection inside radios.
- *Available* for various bands from 28 to 450 MHz.

LNP-( ) PRESELECTOR

NEW

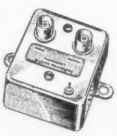
ONLY $39/w&t

- Eliminate intermod!
- Low noise preamp
- Sharp 3-section filter
- Available for bands from 137 to 170 MHz.



LNG-( ) GAAs FET PREAMP

STILL ONLY $59, wired/tested



- Make your friends sick with envy! Work stations they don't even know are there.
- Install one at the antenna and overcome coax losses.

- *Available for 28-30, 46-56, 137-152, 152-172, 210-230, 400-470, and 800-960 MHz bands.*

SUBAUDIBLE TONE ENCODER/DECODER

Access all your favorite closed repeaters!

- **Encodes** all standard CTCSS tones with crystal accuracy and convenient DIP switch selection.
- **Decoder** can be used to mute receive audio and is optimized for installation in repeaters to provide closed access. High pass filter gets rid of annoying rcvr buzz.

- **TD-5** CTCSS Encoder/Decoder Kit ..... now only **$29**
- **TD-5** CTCSS Encoder/Decoder Wired/tested..... **$49**

WEATHER FAX RECEIVER

Join the fun. Get striking images directly from the weather satellites!

A very sensitive wideband fm receiver **optimized for NOAA** APT & Russian Meteor **weather fax** on the 137MHz band.

Covers all 5 satellite channels. Scanner circuit & recorder control allow you to automatically capture signals as satellites pass overhead, even while away from home.

See product review with actual satellite pictures in June 1999 QST, along with info on software and antennas.

- **R139 Receiver Kit** less case **$159**
- **R139 Receiver Kit** with case and AC power adapter **$189**
- **R139 Receiver w/t** in case with AC power adapter ...**$239**
- Internal PC Demodulator Board & Imaging Software **$289**
- Turnstile Antenna **$119**
- Weather Satellite Handbook **$20**

WWV RECEIVER

Get time & frequency checks without buying multiband hf rcvr. Hear solar activity reports affecting radio propagation.

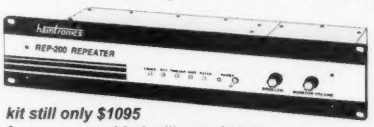
Very sensitive and selective crystal controlled superhet, dedicated to listening to WWV on 10 MHz. Performance rivals the most expensive rcvrs.

- **RWWV Rcvr** kit, PCB only **$59**
- **RWWV Rcvr** kit with cabt, spkr, & 12Vdc adapter **$89**
- **RWWV Rcvr w/t** in cabt with spkr & adapter **$129**

Get more features for your dollar with our

REP-200 REPEATER

A microprocessor-controlled repeater with full autopatch and many versatile dtmf remote control features at less than you might pay for a bare bones repeater or controller alone!



- ***kit still only $1095***
- ***factory assembled still only $1295***

50-54, 143-174, 213-233, 420-475 MHz (902-928 MHz slightly higher.)
☞ **FCC type accepted** for commercial service in 150 & 450 MHz bands.

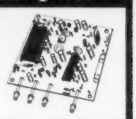
Digital Voice Recorder Option. Allows message up to 20 sec. to be remotely recorded off the air. Play back at user request by DTMF command, or as a periodical voice id, or both. **Great for making club announcements!** ..... **only $100.**

REP-200C Economy Repeater. Real-voice ID, no dtmf or autopatch. .....Kit only $795, w&t $1195.

REP-200N Repeater. Without controller so you can use your own. .....**Kit only $695, w&t $995.**

You'll KICK Yourself If You Build a Repeater Without Checking Out Our Catalog First!

Hamtronics has the world's most complete line of modules for making repeaters. In addition to exciters, pa's, and receivers, we offer the following controllers.



COR-3. Inexpensive, flexible COR module with timers, courtesy beep, audio mixer. .....**only $49/kit, $79 w/t.**

CWID. Traditional diode matrix ID'er. .....**kit only $59.**

CWID-2. Eprom-controlled ID'er.....**only $54/kit, $79 w/t.**

DVR-1. Record your own voice up to 20 sec. For voice id or playing club announcements. .....**$59/kit, $99 w/t.**

COR-4. Complete COR and CWID all on one board. ID in eprom. Low power CMOS. .....**only $99/kit, $149 w/t.**

COR-6. COR with real-voice id. Low power CMOS, non-volatile memory. .....**kit only $99, w/t only $149.**

COR-5. µP controller with autopatch, reverse ap, phone remote control, lots of DTMF control functions, all on one board, as used in REP-200 Repeater. .....**$379 w/t.**

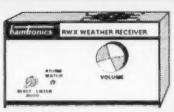
AP-3. Repeater autopatch, reverse autopatch, phone line remote control. Use with TD-2. ..... **kit $89.**

TD-2. Four-digit DTMF decoder/controller. Five latching on-off functions, toll call restrictor. ..... **kit $79.**

TD-4. DTMF controller as above except one on-off function and no toll call restrictor. Can also use for selective calling; mute speaker until someone pages you..... **kit $49.**

WEATHER ALERT RECEIVER

A sensitive and selective professional grade receiver to monitor critical NOAA weather broadcasts. Good reception even at distances of 70 miles or more with suitable antenna. No comparison with ordinary consumer radios!



Automatic mode provides storm watch, alerting you by unmuting receiver and providing an output to trip remote equipment when an alert tone is broadcast. Crystal controlled for accuracy; **all 7 channels** (162.40 to 162.55).

Buy just the receiver pcb module in kit form or buy the kit with an attractive metal cabinet, AC power adapter, and built-in speaker. Also available factory wired and tested.

RWX Rcvr kit, PCB only **$79**
RWX Rcvr kit with cabinet, speaker, & AC adapter **$99**
RWX Rcvr wired/tested in cabinet with speaker & adapter **$139**

Buy at low, factory-direct net prices and save!
For complete info, call or write for complete catalog.
Order by mail, fax, email, or phone (9-12, 1-5 eastern time).
Min. $6 S&H charge for 1st lb. plus add'l weight & insurance.
Use Visa, MC, Discover, check, or UPS C.O.D.

See SPECIAL OFFERS and view complete catalog on our web site:
www.hamtronics.com
email: jv@hamtronics.com

Our 38th Year

hamtronics, inc.
65-D Moul Rd; Hilton NY 14468-9535
Phone 716-392-9430

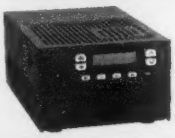
ASTRON CORPORATION
9 Autry Irvine, CA 92618
(949) 458-7277 • (949) 458-0826

E151765 E151765

...POWER ON WITH ASTRON

SWITCHING POWER SUPPLIES...

MODEL SS-10TK



MODEL SS-12IF

SPECIAL FEATURES:

- HIGH EFFICIENCY SWITCHING TECHNOLOGY SPECIFICALLY FILTERED FOR USE WITH COMMUNICATIONS EQUIPMENT, FOR ALL FREQUENCIES INCLUDING HF
- HEAVY DUTY DESIGN
- LOW PROFILE, LIGHT WEIGHT PACKAGE
- EMI FILTER
- MEETS FCC CLASS B

PROTECTION FEATURES:

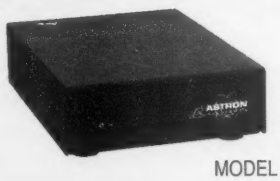
- CURRENT LIMITING
- OVERVOLTAGE PROTECTION
- FUSE PROTECTION.
- OVER TEMPERATURE SHUTDOWN

SPECIFICATIONS:

INPUT VOLTAGE: 115 VAC 50/60HZ
OR 220 VAC 50/60HZ
SWITCH SELECTABLE

OUTPUT VOLTAGE: 13.8VDC

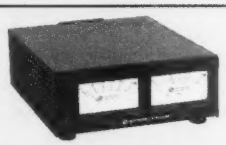
AVAILABLE WIH THE FOLLOWING APPROVALS: UL, CUL, CE, TUV.



MODEL SS-18

DESKTOP SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-10	7	10	1⅞ x 6 x 9	3.2
SS-12	10	12	1⅞ x 6 x 9	3.4
SS-18	15	18	1⅞ x 6 x 9	3.6
SS-25	20	25	2⅞ x 7 x 9⅝	4.2
SS-30	25	30	3¼ x 7 x 9⅝	5.0



MODEL SS-25M

DESKTOP SWITCHING POWER SUPPLIES WITH VOLT AND AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SS-25M*	20	25	2⅞ x 7 x 9⅝	4.2
SS-30M*	25	30	3¼ x 7 x 9⅝	5.0

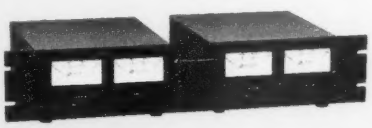
MODEL SRM-30

RACKMOUNT SWITCHING POWER SUPPLIES

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3½ x 19 x 9⅝	6.5
SRM-30	25	30	3½ x 19 x 9⅝	7.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25	20	25	3½ x 19 x 9⅝	6.5
SRM-30	25	30	3½ x 19 x 9⅝	7.0



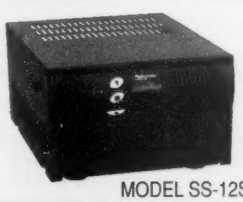
MODEL SRM-30M-2

2 ea SWITCHING POWER SUPPLIES ON ONE RACK PANEL

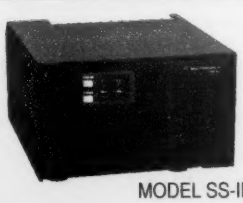
MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25A-2	20	25	3½ x 19 x 9⅝	10.5
SRM-30A-2	25	30	3½ x 19 x 9⅝	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9⅝	10.5
SRM-30M-2	25	30	3½ x 19 x 9⅝	11.0



MODEL SS-12SM/GTX



MODEL SS-IDEFJ-98

CUSTOM POWER SUPPLIES FOR RADIOS BELOW

EF JOHNSON AVENGER GX-MC41
EF JOHNSON AVENGER GX-MC42
EF JOHNSON GT-ML81
EF JOHNSON GT-ML83
EF JOHNSON 9800 SERIES
GE MARC SERIES
GE MONOGRAM SERIES & MAXON SM-4000 SERIES
ICOM IC-F11020 & IC-F2020
KENWOOD TK760, 762, 840, 860, 940, 941
KENWOOD TK760H, 762H
MOTOROLA LOW POWER SM50, SM120, & GTX
MOTOROLA HIGH POWER SM50, SM120, & GTX
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
MOTOROLA RADIUS & GM 300
UNIDEN SMH1525, SMU4525
VERTEX — FTL-1011, FT-1011, FT-2011, FT-7011

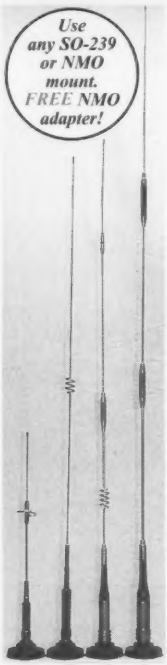
NEW SWITCHING MODELS

SS-10GX, SS-12GX
SS-18GX
SS-12EFJ
SS-18EFJ
SS-10-EFJ-98, SS-12-EFJ-98, SS-18-EFJ-98
SS-12MC
SS-10MG, SS-12MG
SS-101F, SS-121F
SS-10TK
SS-12TK OR SS-18TK
SS-10SM/GTX
SS-10SM/GTX, SS-12SM/GTX, SS-18SM/GTX
SS-10RA
SS-12RA
SS-18RA
SS-10SMU, SS-12SMU, SS-18SMU
SS-10V, SS-12V, SS-18V

*ICS – Intermittent Communication Service

MFJ *RuffRider*™ High Gain Mobile Antennas

Use any SO-239 or NMO mount. FREE NMO adapter!



A. B. C. D.

Shown on mini mag mounts, not included

Each MFJ RuffRider™ mobile antenna comes with MFJ's unique 90 degree "fold-over" feature -- lets you pull into your garage without knocking your antenna over!

MFJ's heavy duty bases are extremely strong to handle super rugged rides and day-to-day highway abuse.

MFJ's *RuffRider*™ High Gain dual band 144/440 MHz mobile antenna series is for the serious mobile ham who demands the highest quality, premium products at reasonable prices.

They feature the finest quality construction using precision machined components. *RuffRiders*™ battle the elements, handle rugged rides and day-to-day highway abuse.

Stacked elements with high-Q phasing coils give you outstanding gain. Stay in solid contact!

Phased Radiators

Phased radiators flattens the radiation pattern and concentrates your power to give you *super gain.*

High-Q phasing coils are housed in weather proof high-tech plastic insulation. They're attached to stainless steel stacked radiators by solid metal end sections.

Heavy Duty Base

Rigid, heavy duty solid metal base reduces SWR flutter due to wind vibration. Two Allen set screws securely fastens radiator.

Specially treated center pin provides excellent electrical connection.

Quickly screws off -- helps prevents theft of your expensive rig.

Use SO-239 or NMO Mounts

RuffRiders™ have a PL-259 base mount for quick installation to your heavy duty SO-239 magnet, trunk/hatch, gutter or mirror mount.

A *free* NMO adapter is included for use with an NMO mount.

MFJ mounts are recommended.

All MFJ *RuffRiders*™ are dual band 144/440 MHz antennas and factory tuned for SWR less than 1.5:1 and have 50 Ohm impedance.

MFJ's *No Matter What*™ **Warranty**

All *RuffRider*™s are covered by MFJ's famous *No Matter What*™ one year limited warranty. MFJ will repair or replace (at our option) your antenna for one full year.

Choose from several different length and gain antennas . . .

A. ***RuffRider Junior*™.** Premium, short 16½" antenna fits in any garage on any auto. ¼ Wave on 2 Meters, ½ Wave, 3 dB gain on 440 MHz. 100 Watts. No fold-over.

MFJ-1402 **$34.95** add s/h

B. ***RuffRider High Power*™.** Just 40" long handles full *200 Watts*. Great for high power mobile amp. ½ Wave, 3 dB gain on 2 Meters, ⅝ Wave, 5.5 dB gain on 440 MHz.

MFJ-1412 **$49.95** add s/h

C. ***RuffRider High Gain*™.** 41½" long antenna gives extra gain with little height increase. Handles 150 Watts. ½ Wave, 3.2 dB gain on 2 Meters, ⅝ Wave, 5.7 dB gain on 440 MHz.

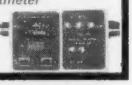
MFJ-1422 **$49.95** add s/h

D. ***RuffRider Hyper Gain*™.** 62½" brute gives a whopping 5 dB gain on ⅞ Wave 2 Meters, ⅝ Wave, 7.6 dB gain on 440 MHz. Our highest gain antenna. Handles 150 Watts.

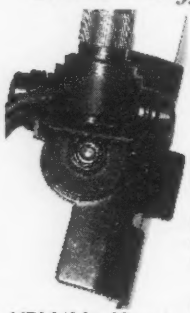
MFJ-1432 **$69.95** add s/h

144/440 MHz Antenna Tuner with *built-in SWR/Wattmeter*

Covers 136 to 175 MHz. Handles 150 Watts. Compact 4x2½x1½". *New!* MFJ-922 **$79.95**



MFJ *RuffRider*™ super heavy duty Antenna Mounts



MFJ-345 Lip Mount is shown mounted vertically to a mini-van's angled hatchback lip. Note extra-wide mount with reinforcing tab at right -- safely secures heavy antennas. Swivel mount is adjusted so antenna is near vertical away from mini-van to clear luggage rack.

Trunk/Hatchback *Lip* Mount

MFJ-345 **$34.95** add s/h

MFJ's *RuffRider*™ super heavy duty solid steel Trunk/Hatchback *Lip* Mount mounts to any lip on your vehicle.

Extra-wide *four* inch lip and large reinforcing tabs on each side safely distributes the load over your vehicle's lip.

Two large set screws on each end of the mounting lip locks your mount in place. A scratch-proof rubber guard protects your vehicle's finish.

Secures large VHF, UHF and medium size HF antennas even at highway speeds.

Mounts on lips at any angle. Two axis of rotation lets you position your antenna vertically, horizontally or at any desired angle. Serrated swivel joints locks securely in place with huge 3/8 inch set screw.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 and locking screw, One year MFJ *No Matter What*™ limited warranty.

Mirror/Luggage *Pipe Clamp* Mount

MFJ-340 Pipe Clamp Mount is shown clamped solidly to vertical mirror support rod on a pickup truck. Antenna is slightly swiveled to the left and positioned about 30 degrees from vertical to clear cab of the pickup truck.

MFJ-340 **$34.95** add s/h

MFJ's *RuffRider*™ Mirror/Luggage *Pipe Clamp* Mount mounts on support rod of mirror, luggage rack or spare tire carrier of your truck, van, RV or SUV. Mounts on any horizontal, vertical or angled rod or pipe up to 5/8 inches in diameter.

Secures VHF, UHF and medium size HF antennas even at highway speeds.

Two axis of rotation lets you position your antenna to any desired angle. Serrated swivel joints locks securely in place with huge 3/8 inch set screw.

Convenient *Thumb and Finger* turn knob makes fold-over operation quick and easy. Locks in twelve positions.

Fold down your antenna at night when pulling into your garage and quickly put it back up to its operating position in the morning.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 base mount and locking screw, MFJ's famous One year *No Matter What*™ limited warranty.

MFJ's *MaxStrength*™ Hi-Flux Antenna Magnet Mounts

MFJ's *MaxStrength*™ high-flux magnet mounts give you maximum pull strength -- your antenna stays on top of your vehicle at highway speeds.

MFJ-333 **$14.95** add s/h

MFJ-335 **$19.95** add s/h

Base is *Euro-style*, black poly or chrome finish with a Mylar protective undersheet.

MFJ magnet mounts come with 17 feet of tough RG-58 coax with a PL-259 connector. Easily reaches operating position.

Choose your favorite antenna to go with these fabulous low-profile mounts for outstanding mobile performance.

MFJ-333 BS/BM, $14.95. Light to medium duty magnet mount. Low profile 3.5 inch diameter black base weighs 1½ lbs. For small to medium size antennas.

MFJ-335 BS/BM, $19.95. Medium to heavy duty magnet mount. Super strong 5 inch diameter *chrome* base weighs a husky 2½ pounds. For medium to large size antennas. It's perfect for MFJ's *RuffRider*™ High Gain mobile antennas.

Order BS for SO-239 connector.
Order BM for NMO connector.

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On the cover: The Fractal Quad Yagi gets reexamined beginning on page 18. We are always looking for interesting articles and cover photos — with or without each other. Your name could be in this space *next* month, and our check could be on its way to *you!* You couldn't use a little extra cash?

Feedback: Any circuit works better with feedback, so please take the time to report on how much you like, hate, or don't care one way or the other about the articles and columns in this issue. G = great!, O = okay, and U = ugh. The G's and O's will be continued. Enough U's and it's Silent Keysville. Hey, this is *your* communications medium, so don't just sit there scratching your...er...head. FYI: Feedback "number" is usually the page number on which the article or column starts.

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NEVER SAY DIE

Wayne Green W2NSD/1
w2nsd@aol.com

Writing for *73*

If you've built something you think other hams might find fun to build, for heaven's sake write and tell us about it. If you've done something unusual in hamming, share it with us. If you've bought a new piece of equipment and want to tell others how much fun you're having with it, get busy with your word processor. Hey, we're all looking to our hobby to be fun and exciting, so share the fun you've had.

When I got involved with RTTY 50 years ago, I had so much fun it should have been illegal. I couldn't help but want to share the fun with as many others as I could, so I started a RTTY newsletter. Pretty soon I had a little 2,000-paid-circulation magazine. And that led to a RTTY column in *CQ*. Then, when I got the editor a better job, I found myself in ham heaven as the editor of the magazine. Wow! And when they owed me so much money they had to fire me, I started *73*. But all that happened because I wanted to share the fun I was having.

Even if you don't want to end up as the editor or publisher of a ham rag, you can help other hams to have more fun by writing about the things you've found exciting.

Which is why I'm trying to get repeaters to provide crossband contacts to the HF DX bands. Which is why I'm urging our experimenters to get busy with compression codes to narrow down voice bandwidths, and maybe even make more than slow scan video possible on the DX bands. And to improve packet throughput. Do it, then write about it.

One more benefit, in addition to the awe and adulation you'll get as a published author, plus some cash from the magazine, is that if you are a sucker enough to be working for others, if you change jobs you'll find that every article you've had published will add about a thousand dollars per year to your new salary.

It's easy to write for *73*. Drop me a note and I'll send you a little booklet with the details. And, now, in these days of digital photography, it's getting easier and easier to submit photos. Even by E-mail.

You can submit articles to *73* by E-mail at [design73@aol.com]. If you have any questions, you can get in touch with me at [w2nsd@aol.com].

Now get busy!

Dayton 1999

Attendees reported that the number of exhibitors was down. The flea market was down. Attendance was way down. The benefit was that it was a lot easier to get around or to get food (none of which was any good for your body). The down side was that there was less to see and less to buy. Many of the exhibitors who did come were crying the blues. And the percentage of computer-oriented exhibitors was up.

I looked over their list of speakers to see what I'd miss if I didn't go this year, thereby saving me almost a week of my time. I found a couple of speakers who looked interesting. Oh, well, that meant more time to get around to the exhibits. But couldn't the organizers have lined up at least one star attraction?

Only the HamVention Committee knows what the actual paid attendance was, and I doubt they'll share this information. The guesstimates I've heard put the attendance at around 15,000 — about half what it was a few years ago.

And that makes sense since the number of new HF hams has dried up, and there isn't a lot of attraction for our no-coders at an ARRL-dominated convention. The sad truth is that almost nothing has changed in the HamVention formula in the last 40 years, while technology has been going through the roof. Dayton, a monument to amateur radio's past.

I attended my first HamVention in 1955. The only difference was that it was then small enough to be held in the Dayton Biltmore Hotel. I attended my first hamfest in 1938 in New York City and, other than the computer exhibitors, I would be hard put to cite any significant changes in the hamfest format back sixty years ago from Dayton today. The big news then was the new Hallicrafters Skyrider Diversity, a receiver technology that never caught on.

How Bad Is It?

Are the predictions of doom for amateur radio just more of the usual Chicken Little hype? Or is there a fire causing all that smoke? I took a quick look at the FCC licensing figures for April 1999, with a comparison of the figures for 1998 and 1997. The number of new Techs has dropped 45% in the last two years. And ditto the number of Techs upgrading to General.

How far is the ARRL going to let this go before they start trying to promote the hobby?

I got a call from a radio station the other day, asking if I'd be interested in running a program about amateur radio. I said I'd give it a try. Then they admitted that they'd called the ARRL first and were told that the program wasn't important enough for the ARRL to be bothered.

Hell, if the League officials and the members don't care whether amateur radio continues or not, why should I go out of my way to do something about it?

Smallpox

This news flash isn't from an E-mail or conspiracy newsletter, it's right out of the July 12th *The New Yorker*! It's a long and interesting article about the world eradication of the smallpox virus — the deadliest virus in history. It's killed more people than any other disease. It's killed over 300 million people just in the 20th century! And that was during a time when large parts of the world population had smallpox vaccinations. Now those have all worn off, leaving the world extremely vulnerable.

Twenty years ago the World Health Organization declared smallpox eradicated from humans. However, it's explosively contagious, traveling by air when an infected person talks. Anyone within ten feet is vulnerable. If you inhale one single particle you'll come down with the disease. You'll feel normal for about ten days, then you suddenly get sick. Very sick. The red spots turn to blisters, which grow and burst, causing incredible pain … and death.

The WHO had ten million doses of the vaccine stored in Geneva until they had all but a half million doses destroyed ten years ago. And that's okay since the only remaining samples of the virus were stored

Continued on page 26

RAMSEY Cool Wireless Goodies

World's Smallest TV Transmitters

We call them the 'Cubes'.... Perfect video transmission from a transmitter you can hide under a quarter and only as thick as a stack of four pennies - that's a nickel in the picture! Transmits color or B&W with fantastic quality - almost like a direct wired connection to any TV tuned to cable channel 59. Crystal controlled for no frequency drift with performance that equals law enforcement models that cost hundreds more! Basic 20 mW model transmits up to 300' while the high power 100 mW unit goes up to 1/4 mile. Audio units include sound using a sensitive built-in mike that will hear a whisper 15 feet away! Units run on 9 volts and hook-up to most any CCD camera. Any of our cameras have been tested to mate perfectly with our Cubes and work great. Fully assembled - just hook-up power and you're on the air! These are the units that are being built into hats, pagers, cigarette packs and sold for big $$!!

C-2000, Basic Video Transmitter.....$89.95
C-2001, High Power Video Transmitter...$179.95
C-3000, Basic Video & Audio Transmitter.....$149.95
C-3001, High Power Video & Audio Transmitter....$229.95

Doppler Direction Finder

Track down jammers and hidden transmitters with ease! This is the famous WA2EBY DF'er featured in April 99 QST. Shows direct bearing to transmitter on compass style LED display, easy to hook up to any FM receiver. The transmitter - the object of your DF'ing - need not be FM, it can be AM, FM or CW. Easily connects to receiver's speaker jack and antenna, unit runs on 12 VDC. We even include 4 handy home-brew "mag mount" antennas and cable for quick set up and operation! Whips can be cut and optimized for any frequency from 130-1000 MHz. Track down that jammer, win that fox hunt, zero in on that downed Cessna - this is an easy to build, reliable kit that compares most favorably to commercial units costing upwards of $1000.00! This is a neat kit!!

DDF-1, Doppler Direction Finder Kit $149.95

CCD Video Cameras

Top quality Japanese Class 'A' CCD array, over 440 line line resolution, not the off-spec arrays that are found on many other cameras. Don't be fooled by the cheap CMOS single chip cameras which have 1/2 the resolution, 1/4 the light sensitivity and draw over twice the current! The black & white models are also super IR (Infra-Red) sensitive. Add our invisible to the eye, IR-1 illuminator kit to see in the dark! Color camera has Auto gain, white balance, Back Light Compensation and DSP! Available with Wide-angle (80º) or super slim Pin-hole style lens. Run on 9 VDC, standard 1 volt p-p video. Use our transmitters for wireless transmission to TV set, or add our IB-1 Interface board kit for audio sound pick-up and super easy direct wire hook-up to any Video monitor, VCR or TV with A/V input. Fully assembled, with pre-wired connector.

CCDWA-2, B&W CCD Camera, wide-angle lens $69.95
CCDPH-2, B&W CCD Camera, slim fit pin-hole lens..... $69.95
CCDCC-1, Color CCD Camera, wide-angle lens $129.95
IR-1, IR Illuminator Kit for B&W cameras $24.95
IB-1, Interface Board Kit. $14.95

Mini Radio Receivers

Imagine the fun of tuning into aircraft a hundred miles away, the local police/fire department, ham operators, or how about Radio Moscow or the BBC in London? Now imagine doing this on a little radio you built yourself - in just an evening! These popular little receivers are the nuts for catching all the action on the local ham, aircraft, standard FM broadcast radio, shortwave or WWV National Time Standard radio bands. Pick the receiver of your choice, each easy to build, sensitive receiver has plenty of crystal clear audio to drive any speaker or earphone. Easy one evening assembly, run on 9 volt battery, all have squelch except for shortwave and FM broadcast which has handy SCA output. Add our snazzy matching case and knob set for that smart finished look.

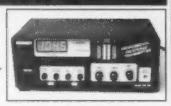
AR-1, Airband 108-136 MHz Kit $29.95
HFRC-1, WWV 10 MHz (crystal controlled) Kit $34.95
FR-1, FM Broadcast Band 88-108 MHz Kit. $24.95
FR-6, 6 Meter FM Ham Band Kit $34.95
FR-10, 10 Meter FM Ham Band Kit. $34.95
FR-146, 2 Meter FM Ham Band Kit. $34.95
FR-220, 220 MHz FM Ham Band Kit. $34.95
SR-1, Shortwave 4-11 MHz Band Kit $29.95
Matching Case Set (specify for which kit) $14.95

Touch-Tone Reader

Read touch-tone numbers from any radio, phone line, tape recorder - any audio source! Decipher called numbers on scanners, radio shows, anywhere touch-tones are used. Memory stores up to 256 digits, an 8 digit display window scrolls anywhere in memory. Memory good for 100 years, even with power off! Runs on 7 to 15 volt DC, Available in kit form with optional matching case set or fully assembled in case set. We sell tons of these to private investigators!

TG-1, Tone-Grabber Touch Tone Reader Kit. $99.95
CTG, Case for Tone-Grabber Touch Tone Reader $14.95
TG-1WT, Tone-Grabber, fully assembled with case $149.95
AC12-5, 12 Volt DC Wall Plug Adapter $9.95

Super Pro FM Stereo Transmitter



Professional synthesized FM Stereo station in easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features we've packed into the FM-100. Set freq with Up/Down buttons, big LED display. Input low pass filter gives great sound (no more squeals or swishing from cheap CD inputs!) Limiters for max 'punch' in audio - without over mod, LED meters to easily set audio levels, built-in mixer with mike, line level inputs. Churches, drive-ins, schools, colleges find the FM-100 the answer to their transmitting needs, you will too. Great features, great price! Kit includes cabinet, whip antenna, 120 VAC supply. *We also offer a high power export version of the FM-100 that's fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped outside the USA, or within the US if accompanied by a signed statement that the unit will be exported.*

FM-100, Pro FM Stereo Transmitter Kit $249.95
FM-100WT, Fully Wired High Power FM-100..... $399.95

Tiny Transmitters

Gosh, these babies are tiny - that's a quarter in the picture! Choose the unit that's best for you. FM-5 is the smallest tunable FM transmitter in the world, picks up a whisper 10' away and transmits up to 300'. Runs on tiny included watch battery, uses SMT parts. FM-4 is larger, more powerful, runs on 5-12 volts, goes up to a mile. FM4,5 operate in standard FM band 88-108 MHz. FM-6 is crystal controlled in 2 meter ham band, 146.535 MHz, easily picked up on scanner or 2 meter rig, runs on 2 included watch batteries. SMT (surface mount) kits include extra parts in case you sneeze & loose a part!

FM-4MC, High Power FM Transmitter Kit $17.95
FM-5, World's Smallest FM Transmitter Kit. $19.95
FM-6, Crystal Controlled 2M FM Transmitter Kit ... $39.95
FM-6, Fully Wired & Tested 2M FM Transmitter $69.95

AM Radio Transmitter

Operates in standard AM broadcast band. Pro version, AM-25, is synthesized for stable, no-drift frequency and is setable for high power output where regulations allow, typical range of 1-2 miles. Entry-level AM-1 is tunable, runs FCC maximum 100 mw, range 1/4 mile. Both accept line-level inputs from tape decks, CD players or mike mixers, run on 12 volts DC. Pro AM-25 includes AC power adapter, matching case and bottom loaded wire antenna. Entry-level AM-1 has an available matching case and knob set that dresses up the unit. Great sound, easy to build - you can be on the air in an evening!

AM-25, Professional AM Transmitter Kit $129.95
AM-1, Entry level AM Radio Transmitter Kit. $29.95
CAM, Matching Case Set for AM-1. ..... $14.95

FM Stereo Radio Transmitters

No drift, microprocessor synthesized! Excellent audio quality, connect to CD player, tape deck or mike mixer and you're on-the-air. Strapable for high or low power! Runs on 12 VDC or 120 VAC. Kit includes case, whip antenna, 120 VAC power adapter - easy one evening assembly.

FM-25, Synthesized Stereo Transmitter Kit $129.95

Lower cost alternative to our high performance transmitters. Great value, easily tunable, fun to build. Manual goes into great detail about antennas, range and FCC rules. Handy kit for sending music thru house and yard, ideal for school projects too - you'll be amazed at the exceptional audio quality! Runs on 9V battery or 5 to 15 VDC. Add our matching case and whip antenna set for nice 'pro' look.

FM-10A, Tunable FM Stereo Transmitter Kit. $34.95
CFM, Matching Case and Antenna Set $14.95
FMAC, 12 Volt DC Wall Plug Adapter. $9.95

FM Station Antennas

For maximum performance, a good antenna is needed. Choose our very popular dipole kit or the Comet, a factory made 5/8 wave colinear model with 3.4 dB gain. Both work great with any FM receiver or transmitter.

TM-100, FM Antenna Kit $39.95
FMA-200, Vertical Antenna $114.95

RF Power Booster

Add muscle to your signal, boost power up to 1 watt over a freq range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM transmitters, providing radio service through an entire town. Runs on 12 VDC. For a neat finished look, add the nice matching case set.

LPA-1, Power Booster Amplifier Kit $39.95
CLPA, Matching Case Set for LPA-1 Kit $14.95
LPA-1WT, Fully Wired LPA-1 with Case..... $99.95

Dinky Radios

Everyone who sees one of these babies says they just gotta have one! Super cute, tiny (that's a Quarter in the picture!) FM radios have automatic scan/search tuning, comfortable ear bud earphones and we even include the battery. The pager style unit looks like a shrunken pager and even has an LCD clock built-in. The crystal clear sound will amaze you! Makes a great gift.

MFMT-1, World's Smallest FM Radio. $11.95
PFMR-1, Pager Style LCD Clock & FM Radio $12.95

Order Toll-free: 800-446-2295

Sorry, no tech info, or order status at 800 number

For Technical Info, Order Status
Call Factory direct: 716-924-4560

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QRX . . .

Sayonara

One of the world's best-known DXers is no longer a licensed radio amateur. This, with the announcement that Yasuo Miyazawa JH1AJT, has surrendered his amateur radio station license to Japanese telecommunications authorities in the wake of accusations that another ham sat in for Miyazawa's upgrade examination.

Going by the nickname of Zorro, JH1AJT was one of the rising stars in the DX world until last June. That's when the *Daily DX* newsletter carried an article from a Japanese-language newspaper saying that Miyazawa and another Japanese amateur had been arrested after allegedly obtaining an operator license using false identification.

According to the *Daily DX* story, in October 1955, Hirohiko Daikoku JG3QCW allegedly took Japan's Second Class amateur license test for Miyazawa. At the time, Miyazawa was a Fourth Class ticketholder. That's the equivalent of our No-Code Tech.

The circumstances surrounding the investigation that lead to Miyazawa's arrest have never been revealed. It is known that in addition to his own JH1AJT ticket, Miyazawa has also turned in the callsign 7J1YAJ, for which he was a trustee.

Over the years, Miyazawa has operated from many sought-after DX spots throughout Asia, Africa, and the Pacific. He had been scheduled to receive the DXer of the Year Award at the New Orleans International DX Convention on August 28th. By mutual consent that award was not given this year.

Thanks to David Black KB4KCH, reporting for Newsline, *Bill Pasternak WA6ITF, editor.*

Only in America ...

Only in America ... can a pizza get to your house faster than an ambulance.

Only in America ... are there handicap parking places in front of a skating rink.

Only in America ... do people order double cheeseburgers, a large fries, and a Diet Coke.

Only in America ... do banks leave both doors open and then chain the pens to the counters.

Only in America ... do we leave cars worth thousands of dollars in the driveway and leave useless things and junk in boxes in the garage.

Only in America ... do we use answering machines to screen calls and then have call waiting so we won't miss a call from someone we didn't want to talk to in the first place.

Only in America ... do we buy hot dogs in packages of 10 and buns in packages of eight.

Only in America ... do we use the word "politics" to describe the process so well: "poli" in Latin meaning "many" and "tic" meaning "blood-sucking creatures."

Thanks to the Internet's "Joke A Day," as reprinted in the November 1998 ARNS Bulletin.

Top 10 New Codes and Procedural Symbols for CW Operating

10. Sent: 4vv44

Meaning: Rig works fine, but I don't know how to send code.

9. Sent: CAA

Meaning: I want to call CQ, but I don't know how to send code.

8. Sent: QRL ... CQ

Meaning: I can send OK, but I don't know procedure.

7. Sent: H99 or HNN

Meaning: Your report is great, but I don't know how to send code.

6. Sent: CQ ... KN

Meaning: I can send OK, but I don't know procedure.

5. Sent: SRI QRM ES QRN ES QSB

Meaning: I can send OK, but I can't copy code.

4. Sent: R R R ...

Meaning: Copied just fine, but I haven't thought up something to say yet.

3. Sent: BT... BT... BT

Meaning: Trying to think of something else to say.

2. Sent: NAME IS 606

Meaning: My name is Bob and I can't send code.

And the Number 1 New Code or Procedural Symbol for CW Operating:

1. Sent: CQ NV

Meaning: I'm in the contest, but I can't send code.

Thanks to Low Down, *official journal of the Colorado QRP Club [cqc@aol.com].*

The World's Greatest Computer

Imagine a computer the size of a grapefruit, packed with 10 billion transistors and 10 trillion wires. Imagine, too, that this computer grows to full size all by itself, from a set of plans far too small for the eye to see. And imagine that it spends its long lifetime, commonly 70 years or more, running its own support machinery; that it keeps itself at a comfortable working temperature and supplied with energy and raw materials; and that it learns from its mistakes. Add to this the ability to add up grocery bills, prepare tax returns, write poetry, enjoy music, dream of dragons, and fall in love. What you have imagined, of course, is your own brain.

Thanks to the September 1998 issue of The Electron, *the newsletter of the Sterling-Rock Falls ARS, Lunda Bramm KB9CZD, editor.*

More Laws

• O'Reilly's Law of the Kitchen: Cleanliness is next to impossible.

• Lieberman's Law: Everybody lies, but it doesn't matter since nobody listens.

• Gold's Law: If the shoe fits, it's ugly.

• Conway's Law: In any organization, there will always be one person who knows what is going on. This person should be fired.

• Finster's Law: A closed mouth gathers no feet.

• Lynch's Law: When the going gets tough, everyone leaves.

• Muir's Law: When we try to separate anything out by itself, we find it hitched to everything else in the universe.

• Glyme's Formula for Success: The secret of success is sincerity. Once you can take that, you've got it made.

• Mason's First Law of Synergism: The one day you'd sell your birthright for something, birthrights are a glut.

• Hanlon's Razor: Never attribute to malice that which is adequately explained by stupidity.

• Handy Guide to Modern Science: If it's green or wriggles, it's biology. If it stinks, it's chemistry. If it doesn't work, it's physics.

• Green's Law of Debate: Anything is possible if you don't know what you're talking about.

• Stewart's Law of Retroaction: It is easier to get forgiveness than permission.

• First Rule of History: History doesn't repeat itself, historians merely repeat each other.

• Oliver's Law of Location: No matter where you go, there you are.

• Harrison's Postulate: For every action, there is an equal and opposite criticism.

This appeared in the August 1998 issue of Watts News, *the monthly newsletter of the Olympia (WA) ARS, George Lanning KB6LE, editor. It was reprinted in the November 1998 ARNS* Bulletin. *By the way, to these we add Burnett's Decree of Destination Delay: The more in advance you know about something, the later to it you will be.*

Windows 2000 Error Messages

The following are new Windows messages that are reportedly included in Windows 2000:

1. Enter any 11-digit prime number to continue.

2. Press any key to continue or any other key to quit.

3. Press any key except ... no, No, NO, NOT THAT ONE!

4. Bad command or file name! Go stand in the corner.

5. This will end your Windows session. Do you want to play another game?

6. Error saving file! Format drive now? (Y/Y)

7. This is a message from God Gates: "Rebooting the world. Please log off."

8. To "shut down" your system, type "WIN."

9. BREAKFAST.SYS halted ... Cereal port not responding.

10. COFFEE.SYS missing ... Insert cup in cup holder and press any key.

11. File not found. Should I fake it? (Y/N)

12. Runtime Error 6D at 417A:32CF: Incompetent User.

13. Error reading FAT record: Try the SKINNY one? (Y/N)

14 WinErr 16547: LPT1 not found. Use backup (PENCIL & PAPER.SYS).

15. User error: Replace user.

16. Windows VirusScan 1.0—Windows found; Remove it? (Y/N)

17. Your hard drive has been scanned and all stolen software titles have been deleted. The police are on the way.

Thanks to the Internet's "Joke A Day," as reprinted in the November 1998 ARNS Bulletin.

Credit Cards

ARRL not in the credit card business: Some League members recently have reported receiving solicitations from telemarketers for a credit card offering to radio amateurs. The ARRL is not involved with these solicitations nor has the League sold members' names, addresses, or telephone numbers to telemarketing organizations.

Thanks to the September 1999 issue of the Chicago FM Club's Newsletter, Squelch Tale.

Noah and the Ark

The Lord spoke to Noah and said, "Noah, in six months I am going to make it rain until the whole world is covered with water and all the evil things are destroyed. But, I want to save a few good people and two of every living thing on the planet. I am ordering you to build an ark."

And, in a flash of lightning, he delivered the specifications for the ark. "OK," Noah said, trembling with fear and fumbling with the blueprints, "I'm our man." "Six months and it starts to rain," thundered the Lord. "You'd better have my ark completed or learn to swim for a long, long time!" Six months passed, the sky began to cloud up, and the rain began to fall in torrents. The Lord looked down and saw Noah sitting in his yard, weeping, and there was no ark.

"Noah!" shouted the Lord, "where is My ark?" A lightning bolt crashed into the ground right beside Noah. "Lord, please forgive me!" begged Noah. "I did my best, but there were some big problems. First, I had to get a building permit for the ark's construction, but your plans did not meet their code. So, I had to hire an engineer to redo the plans, only to get into a long argument with him about whether to include a fire-sprinkler system.

"My neighbors objected, claiming that I was violating zoning ordinances by building the ark in my front yard, so I had to get a variance from the city planning board. Then, I had a big problem getting enough wood for the ark, because there was a ban on cutting trees, to save the spotted owl. I tried to convince the environmentalists and the U.S. Fish and Wildlife Service that I needed the wood to save the owls, but they wouldn't let me catch them, so no owls.

"Next, I started gathering up the animals, but got sued by an animal rights group that objected to me taking along only two of each kind. Just when the suit got dismissed, the EPA notified me that I couldn't complete the ark without filing an environmental impact statement on your proposed flood. They didn't take kindly to the idea that they had no jurisdiction over the conduct of a Supreme Being.

"Then, the Corps of Engineers wanted a map of the proposed flood plain. I sent them a globe! Right now, I'm still trying to resolve a complaint with the Equal Opportunities Commission over how many minorities I'm supposed to hire.

"The IRS has seized all my assets, claiming that I am trying to leave the country, and I just got a notice from the state that I owe some kind of use tax. Really, I don't think I can finish the ark in less than five years." With that, the sky cleared, the sun began to shine, and a rainbow arched across the sky. Noah looked up and smiled.

"You mean you are not going to destroy the world?" he asked hopefully.

"No," said the Lord. "I'm too late — the government already has."

Thanks to the September 1999 Squelch Tale.

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LETTERS

From the Ham Shack

Tomes Theodorelos, San Diego. I have heard many of the reasons and the regrets about the decline in the number of new ham licenses being issued. I would like to add my observations. I held one of the old 1-year Novice licenses in the late 1950s, and I had many pleasant contacts with hams who would go out of their way to help newcomers. I am sure most hams are that way even now, but I think the "gatekeepers" may be having trouble with being friendly and helpful.

I have been planning to get another Novice license so I looked up "Ham Radio" in the San Diego Yellow Pages. I saw the listing for a store which I had visited without pleasure several years ago. I thought I would try again. However, I was quickly reminded of the cold reception I had on my first visit. There were two people behind the counter who could take the first- and second-place prizes for cold and unfriendly to all but the customers whom they knew by name.

It's too bad, since this seems to be one of the largest ham radio supply stores around. Judging from their ads in *QST*, they are probably one of the first places a prospective ham might try to look around. While I was in the store, one of these counter persons remarked to one of their customers how ham radio was going down, "never to return."

It seemed almost prophetic coming from him, especially since people like him must be contributing to the demise. I wonder if the new equipment manufacturers have the same attitude: "Here's the stuff. If you want it, OK. If you don't, we couldn't care less." I will never patronize any store in that chain in the future, and even though it would help your advertising revenue, I'm glad not to see their ads in *73*. Thanks for all you are doing to promote ham radio, Wayne.

Gregg Hoover W8GH. In the latest *CQ* Washington Readout column, Frederick Maia W5YI chastises as stubborn hams who oppose the illegal SSN demand with an erroneous and misleading analysis of the Debt Collection Improvement Act of 1966. He overlooks or ignores the word "and" between parts D and E of the Act, and the key importance of part E.

The essential facts are as follows: Licensees are not, as FCC amateur fact sheet 206.pdf asserts, automatically doing business with the FCC simply by having a FCC license. Having a FCC license is only one of two conditions that must be met to classify a person as doing business with the FCC under the Debt Collection Improvement Act of 1996. Before a person is considered to be doing business with the FCC, the person must also be in a relationship with the FCC, such as a cosigner or insurer of a loan administered by the FCC, which could make that person responsible for repayment of the loan if defaulted upon by the original borrower.

The relevant part of the Debt Act is: (i)(1) IN GENERAL. Section 7701 of title 31, United States Code, is amended by adding at the end the following new subsections: (c)(1) The head of each Federal agency shall require each person doing business with that agency to furnish to that agency such person's taxpayer identifying number. (2) For purposes of this subsection, a person shall be considered to be doing business with a Federal agency if the person is: (A) a lender or servicer in a Federal guaranteed or insured loan program administered by the agency; (B) an applicant for, or recipient of, a Federal license, permit, right-of-way, grant, or benefit payment administered by the agency or insurance administered by the agency; (C) a contractor of the agency; (D) assessed a fine, fee, royalty; or penalty by the agency; and [NOTE — G.H.] (E) in a relationship with the agency that may give rise to a receivable due to that agency, such as a partner of, a borrower in, or a guarantor of a Federal direct or insured loan administered by the agency. (3) Each agency shall disclose to a person required to furnish a taxpayer identifying number under this subsection its intent to use such number for purposes of collecting and reporting on any delinquent amounts arising out of such person's relationship with the Government.

Before the Debt Act amended section 7701, only loan applicants were required to provide an SSN.

It is wrong to say that E is just a fifth condition like A through D. The word "or" would have been used, not "and." It is also wrong to say that all hams are indeed in just such a debt relationship envisioned by E, since, as ARRL editor David Sumner K1ZZ says, all amateurs are subject to monetary forfeiture under 47 USC 503, and the "such as" language in E is illustrative, and not limiting. Aside from the shameful absurdity of Mr. Sumner's statement, it is incorrect because the FCC can fine any person under 47 USC 503. If a person is in a potential debt relationship because the FCC can fine him under 47 USC 503, then all persons, licensees or otherwise, are already automatically in an E relationship. Why would Congress add part E, giving examples of persons in a relationship, if all persons were already in such a relationship?

The language in E can honestly, rationally, and legally only be read as limiting. When Congress intended language of the Debt Act to not be limiting, it specifically stated so as it did in section (h): (h) Section 5514 of title 5, United States Code, is amended: (A) in subsection (a): (i) by adding at the end of paragraph (1) the following: All Federal agencies to which debts are owed and which have outstanding delinquent debts shall participate in a computer match at least annually of their delinquent debt records with records of Federal employees to identify those employees who are delinquent in repayment of those debts. The preceding sentence shall not apply to any debt under the Internal Revenue Code of 1986. Matched Federal employee (note) records shall include, but shall not be limited to, records of active Civil Service employees governmentwide, military active duty personnel, military reservists, United States Postal Service employees, employees of other government corporations, and seasonal and temporary employees.

FCC amateur fact sheet 206 makes no mention of the additional requirement in E. The FCC is administering ULS registration as if the word "and" between parts D and E of the Act was not there. To the FCC, Congress put the additional requirement there, but for no legal effect. If E has no legal effect, why do any other parts of the Debt Act have legal effect?

But, it does have major effect and is of key importance in a debt collection act. It should not seem strange that a Debt Act would include a requirement for potential debt. For persons without a potential debt situation, it makes no sense for the Congress in a debt collection act to compel the FCC, or any agency, to treat them as if they were until such a condition arises. That is why Congress restricts agencies like the FCC from the SSN/TIN requirement with E. Until a person falls under one or more of

Continued on page 57

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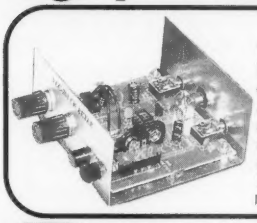

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Need a UHF Dipper?

Part 1: Old TV tuners to the rescue!

Hugh Wells W6WTU
1411 18th Street
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There are periods of time in the life of a ham experimenter when he needs a dipper to identify the resonant frequency of an RF circuit. Dippers, both tubed and solid state, have been around for many years to assist in the identification, but most cover the frequency bands from about 2 MHz to 250 MHz. There are dipper designs available for frequencies above 250 MHz, but they tend to be difficult to build with any reliability. Another problem involved is that the external sense loop for most dippers is too short when operated in the UHF region. The loop is the resonant circuit for the oscillator and is also used for probing an unknown resonator. Being short, it fails to reach very far, making the dipper very awkward to use.

I was in need of a 450 MHz dipper and began a search for a suitable device. It occurred to me that most any stable oscillator would work if it was operating at the desired frequency. One solution that was available to me was an old solid state UHF TV tuner. The one that I chose as a candidate for the dipper project was one of the mechanically variable variety as shown in **Fig. 1**. The frequency range of the oscillator is typically 470–900 MHz, which means that some modification would be required to shift the lower frequency into the 450 MHz ham band. But the first objective was to prove or disprove the theory that the tuner would be a suitable candidate for a dipper project. At this point, a number of tuners have been modified to function as dippers, with each being an interesting adventure. The one objection with most typical dipper designs has been the short external sense loop when used at UHF. Using the TV tuner as a dipper, the sense loop can be extended for probing an unknown circuit.

Varactor-tuned UHF tuners were examined as dipper candidates, but were abandoned temporarily in favor of the old mechanical versions. However, the

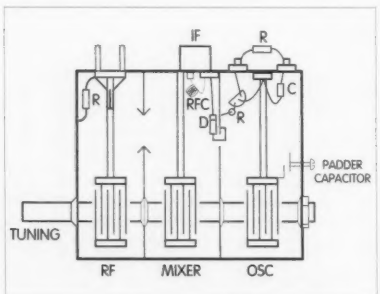

Fig. 1. Typical mechanical UHF TV tuner.

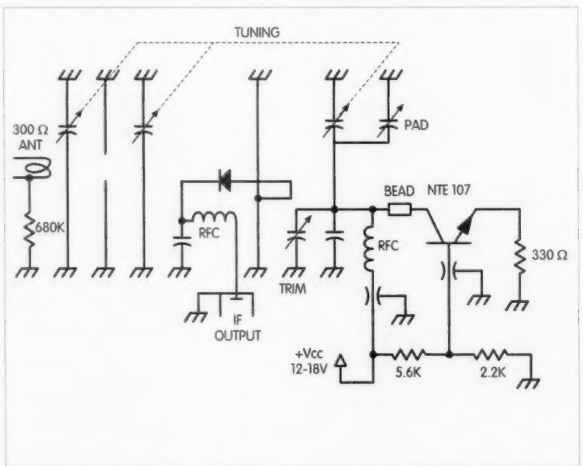

Fig. 2. Typical schematic for a mechanical UHF tuner. A varactor, if used in the tuner, is connected in parallel with the "trim" capacitor.

varactor versions appear to show some promise and will require some further investigation of feasibility.

The simple electronic circuit of the mechanical tuner, as shown in **Fig. 2**, makes the tuner very adaptable for dipper projects. Only minor modifications along with some experimentation are required to use the tuner as a dipper covering the stock frequency range of approximately 670–900 MHz. From my experiments, I know that some tuners can be coaxed to operate up into the lower portion of the 902 MHz band. I managed to get one to move up to about 928 MHz. However, my effort has been to lower the operating band for the tuner to function within the 450 MHz band. After modifying several tuners, I've found that some tuners move easily into the band while others are very stubborn and require "surgery." It is my suggestion that a tuner be made to operate in the stock configuration as a dipper, to evaluate its characteristics, before any surgery is considered or performed. The modifications can be performed progressively, with surgery only as the very last resort.

The local oscillator and diode mixer are really the only components of interest in the tuner, when used as a dipper, so the rest of the assembly can simply be ignored. When using the tuner as a dipper, the mixer diode is used as the RF activity sensor and is capable of driving a microammeter.

Testing a tuner involves measuring the operating frequency of the local oscillator. In the absence of a sensitive counter, spectrum analyzer, or calibrated receiver covering the frequency band, alternative and less exacting measurement methods must be employed.

During my early experiments in the UHF spectrum, specialized test equipment was unavailable to me; I'll assume that you are in the same predicament. To get over the hurdle of frequency measurements, some relatively simple techniques may be employed. But the methods require some ingenuity, patience, and project construction.

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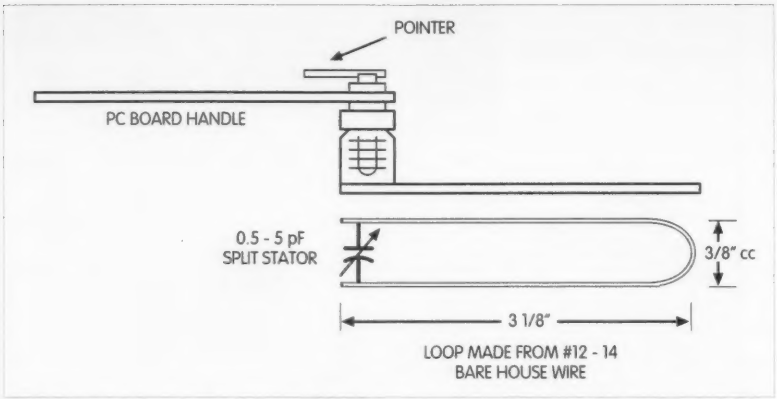

Fig. 3. Construction of an absorption wave meter tunable in the 400–500 MHz band.

an absorption wave meter. Both are resonant circuits that can be calibrated during the tuner's testing process. In use, the Lecher wires are used to determine the frequency of the oscillator; then the oscillator, as a dipper, is used to calibrate the wave meter. The reason for having two pieces of equipment is to end up with a single measurement device — a calibrated absorption wave meter. Successive frequency measurements will allow the wave meter shown in **Fig. 3** to be calibrated, and from that point on, the wave meter may be used for checking the dipper's response.

Lecher wire system

To get started in the absence of other frequency measurement equipment, it is necessary to construct a set of Lecher wires as shown in **Fig. 4(a)**, where there is a lot of freedom in the construction. This means that available material from the "junk box" is suitable. When constructing the Lecher wire system, there are only three important factors: (1) keep the wires taut; (2) have the wires close to the measurement scale; and (3) have a readable scale. The objective of keeping the wires taut is to enhance measurement repeatability. Wires do tend to stretch, so copper wire is OK, but may not be your first choice. As an alternate, iron or steel wire may also be used. Wire diameter and insulation are immaterial. In other words, enameled wire may be used without removal of the enamel. When using the Lecher wires, a narrow metal edge, such as a screwdriver shaft, is laid across the wires and then moved fore and aft, locating two points one half-wave wavelength apart. The operating frequency can be determined by placing the measured distance between the points into an appropriate equation. A block of insulating material, as shown in **Fig. 4(b)**, is rubber banded to the screwdriver shaft. The purpose of the block is to help maintain the wire spacing. Actually, the use of the block is optional when only light pressure is applied against the wires.

Perhaps the measurement scale is the easiest to make. Photocopies of a yardstick or meterstick will yield paper scales that may be glued to the board. The resulting measurements will be reasonably accurate, and that's the bottom line. **Figs. 5** and **6** show the method used and the appropriate equations as they apply to making a frequency measurement with Lecher wires.

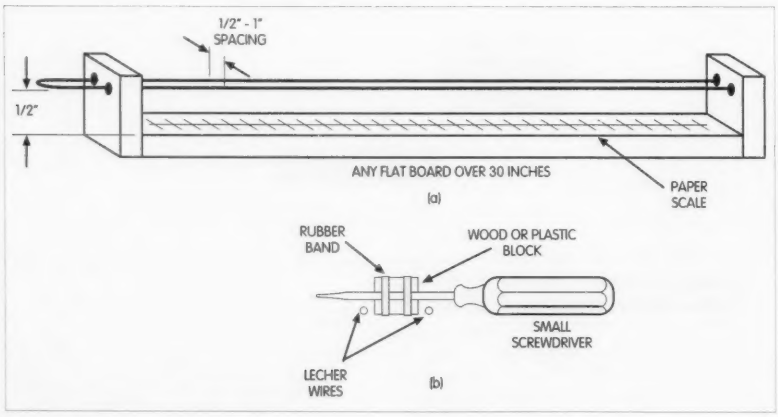

Fig. 4(a). Construction of a Lecher wire system. Wires are stretched tight.
Fig. 4(b). Use of a screwdriver as a shorting bar. Block is used to help maintain wire spacing.

Theory of resonator operation

Before making any modifications to a TV tuner, the theory regarding the internal resonator needs to be discussed so that the modification process will make more sense. Resonators used at lower frequencies are made up of a coil and capacitor, but as the operating frequency rises, the lumped inductance and capacitance of the coil and capacitor becomes distributed and less definable. In the case of the older UHF TV tuners, a quarter-wave wire having distributed inductance and capacitance is used within a channel as the basis for a resonator. The resonator may be likened to that of a quarter-wave antenna element as shown in **Fig. 7**. It is important to observe the E (voltage) and I (current) fields that exist around the element, as these fields are affected by the surrounding environment, and specifically by the variable capacitor at the top of the element. The resonator element may be identified as a metal strip or wire enclosed in the channel. The resonator is at RF ground on one end, with a variable capacitor on the other end. The capacitor operates as capacitive top loading on the open end of the resonator, as shown in **Fig. 8**.

Not shown in a figure is the effect of capacitive bottom loading on the resonating element. Some tuners utilize a varactor diode on the bottom of the element to trim the frequency as a result

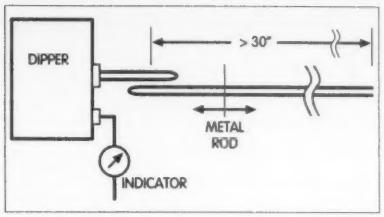

Fig. 5. Lecher wire system for measuring the frequency of a dipper.

of an applied variable voltage. Also, some tuners have a trimmer capacitor in parallel with the varactor for the initial setting of the operating band. Decreasing the bottom loading capacitance raises the operating frequency and, likewise, increasing the capacitance lowers the frequency.

Of concern is the effect that the capacitance loading, both top and bottom, has on the E-field of the resonator, because the results will guide us during the consideration for modifying the resonator. The worst case scenario is shown in **Fig. 9**, where the capacitive top loading has been increased to the point where the resonator changes mode from a quarter-wave to a half-wave element. When that happens, the resonator is essentially operating at twice the original frequency. Although this might be a desirable condition for some tuner applications, it isn't likely to happen. Also, the electronic circuit attached to the resonator may not support the mode change because of the drastic shift in transistor feedpoint impedance.

Oscillator

A transistor is connected to the RF ground end of the resonator and functions as a Colpitts oscillator driving

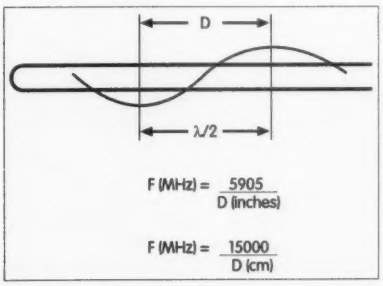

Fig. 6. Determining the approximate operating frequency using a Lecher wire system.

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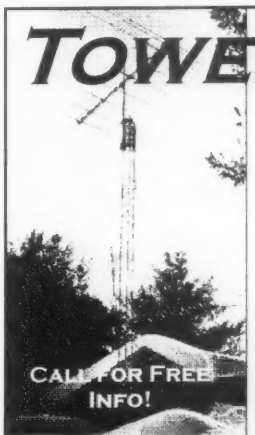

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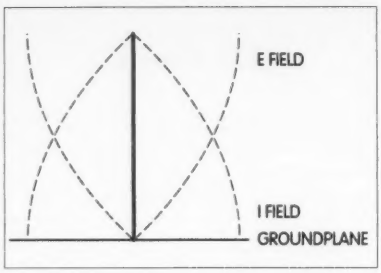

Fig. 7. Quarter-wave resonator with voltage and current fields shown.

the resonator. With the transistor connected as used in the TV tuner, it is matched to the bottom of a quarter-wave element. But when the element is excessively loaded, the transistor will fail to oscillate because of a loss of feedback. In most cases, the oscillator will stop oscillating when too much capacitive loading, top or bottom, is applied. A simple explanation for the loss is the drastic imbalance of "feedback capacitance" vs. "loading" capacitance. Decreasing the loading capacitance will usually allow the oscillator to restart. The stopping and starting action of the oscillator may be monitored by observing the meter attached to the mixer diode. Sometimes an increase in oscillator feedback will assist in sustaining oscillation even with a heavy element load.

Metering circuit

Most of the tuners that I've modified for use as dippers have provided about 2 mA of current when the oscillator is operating. At that current level, most any analog panel meter having a full-scale current value less than 2 mA will work well in the dipper application. But to keep the oscillator loading to a minimum, I'd suggest keeping the actual meter current as low as possible, perhaps in the 50–200 µA range. A suitable pot may be included in series with the meter to provide a meter level adjustment as shown in **Fig. 10**.

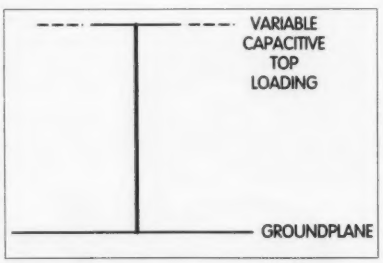

Fig. 8. Quarter-wave resonator with variable capacitive top loading.

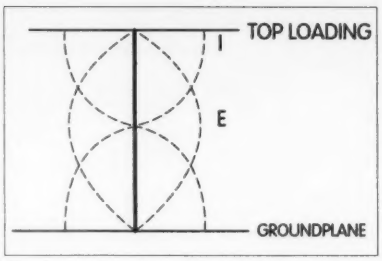

Fig. 9. Excessive capacitive top loading forces a quarter-wave element to operate as a half-wave element.

Another thing that I've observed with tuners is that the polarity of the mixer diode varies from tuner to tuner. Of course, the reason is obvious because when used as a mixer, diode polarity is immaterial. Should the diode's polarity need to be reversed, then care must be taken during the modification process because excessive heat can damage the diode. Regardless, the tuner-dipper project is not dependent upon the diode polarity. Just select the meter's polarity to match the diode.

Some tuners have an RF choke from the mixer jack to ground. One end of the choke must be opened to allow the diode current to pass through the meter.

Part 2 of this series will continue with a discussion of the sense loop schemes and testing. Part 3 will describe the modifications that can be used to permit using the tuner as a dipper. 73

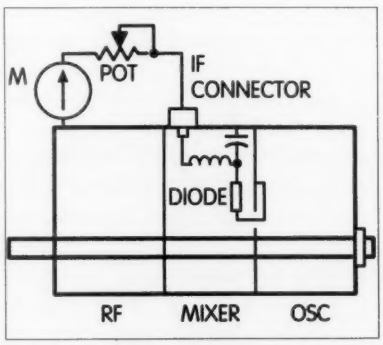

Fig. 10. Using a microammeter as the oscillator's activity monitor/dip indicator. A pot is used for adjusting the indication level.

HT Porta-Power Project

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There are times in amateur radio operations when it would be nice to have the convenience of a hand-held (HT) transceiver, yet still be able to have power other than the HT's own battery pack available. This external power source would have to provide power for an extended period of time for prolonged HT operation. Also, the external source must be portable. If that were not enough, this whole package would have to be easy to configure for stand-alone HT usage as well as for extended operating applications. And going even further, the entire package must be put together without any costly specialized packaging fabrication.

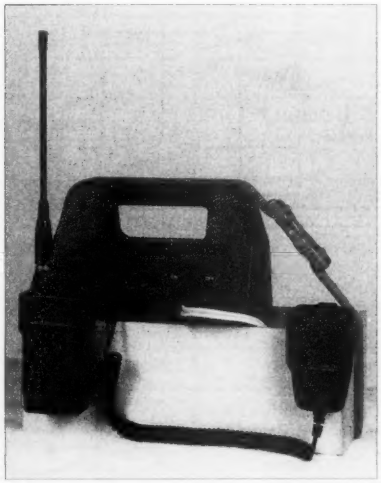

Photo A. *An external power package for your HT.*

The solution lies in finding rather readily available materials and supplies that commonly would not be thought of as usable in this application. Let's take a look at the various items it takes to put this package together. First, we need a portable yet high capacity DC power source. Second, some sort of container to hold the various pieces together. And lastly, the entire mélange has to be fastened together in some sort of integrated package, which can be easily transported with one hand.

External DC power source

For this, I chose the Power Station, as sold by The Ham Contact. It fit the bill regarding both high capacity and easy portability. It is a neat package in itself. It supplies 12 VDC as well as 9, 6, and 3 VDC. The 12 VDC output is accessible via a front cigarette lighter receptacle, in addition to positive (+) and negative (-) terminals on the rear of the unit. The unit contains a 12 V, 7 Ah sealed battery, which will provide nicely for extended HT usage. A built-in meter reads the voltage of the 12 V, 7 Ah battery, and is marked for easy determination of when the battery needs to be charged. Two charging options are included in the unit. It may be charged from an AC outlet or from a DC source such as the cigarette lighter of a vehicle. Both charging cords are supplied.

The box to hold it all

This should not be rocket science, but trying to find an appropriate container without custom building one took some searching. The belt clip on the HT was to be utilized to affix the HT to the box. The wall thickness of the box could not be too great, as it had to accommodate the HT belt clip. Readily available plastic containers had a rolled-type edge, which would not allow the belt clip to be attached because the edge thickness was too great. What did work was a wooden box used to hold compact discs (CDs). The box has a wall thickness of about

Continued on page 39

FM CW!

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Recently, my friend Dave N9ZAZ mentioned a CW net he had joined that presented a unique challenge: The CW was being sent via an FM transceiver. How could it be done without the operation becoming a hopeless kluge?

Initial attempts included holding a microphone next to a sidetone oscillator and keying the oscillator with the other hand. This method proved rather cumbersome, and the background noise sent along with the CW could be distracting.

Feeding the sidetone oscillator directly into the microphone's audio input was a step in the right direction, but was still lacking. How could a sidetone oscillator do everything—send a tone, and key (and unkey) the transceiver—all without the need to go out and buy a new (and much more expensive) transceiver?

I developed the circuit shown in **Fig. 1** and hooked it in parallel with the microphone, so that either the microphone (for FM operation) or the CW circuit could be used without having to unplug one while using the other. The first half of a monostable oscillator (U1A) was wired in a retriggerable mode. The CW code key will trigger its timing cycle, set for approximately two seconds. This will allow enough

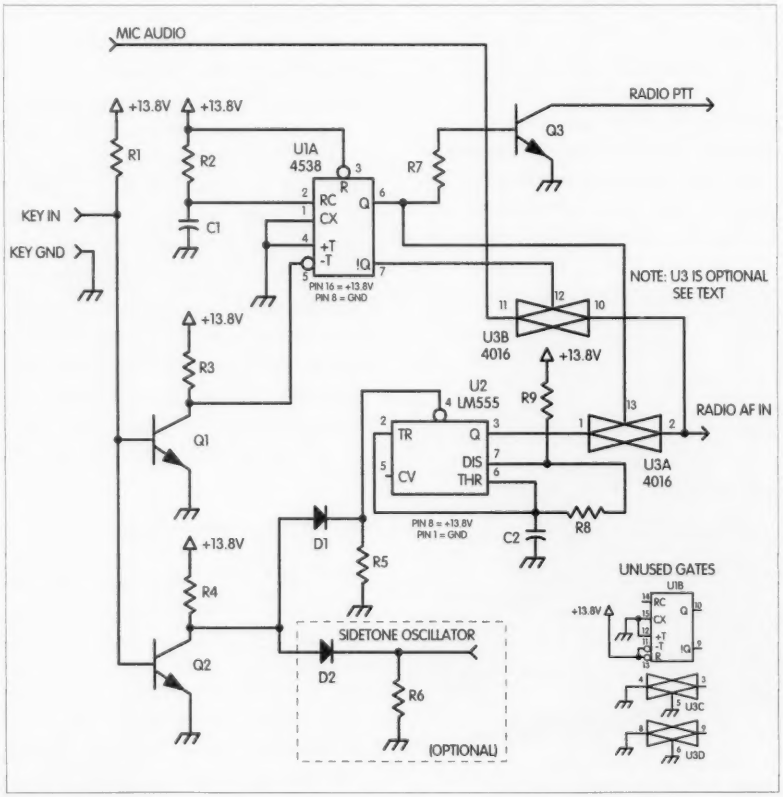

Fig. 1. Schematic.

time (space) between CW words so as not to run them together without the transceiver toggling from transmit back to receive (the transceiver is toggled into transmit via Q3, driven by oscillator U1A).

At the same time that U1A toggles the radio into transmit, it disables the microphone audio via U3B. This avoids having stray audio creep into the transmit audio, as well as having the microphone's impedance affect CW operation.

U2, a 555 oscillator set to run at about 1 kHz, is triggered at the same time as U1A. The 555 oscillator is fed to the transceiver's audio input through U3A, a second analog switch that, in this case, isolates the 555 when the microphone is used for FM operation.

When CW operation ceases, U1A times out (allowing the transceiver to toggle back to receive), enables the microphone audio through U3B, and isolates the CW circuit's audio through U3A.

If the operator wishes to monitor his/her own signals, U2 can be conveniently duplicated, with pin 4 being wired to the junction of R6 and D2.

I built the prototype circuit with a microphone jack at one end, so that the radio can be used either with FM or CW without having to unplug either the CW circuit or the microphone for operation in the other mode. A short "pigtail" wire with a microphone plug, an on/off switch, a power connector, a speaker, and key jacks completed the enclosure.

For ease of operation, this circuit is powered from the same power supply used for the mobile transceiver. To help ensure clean operation, the circuit was mounted in a small metal enclosure with the enclosure tied to ground, and a small filter capacitor was soldered across all input and output leads (this is optional, depending upon the amount of stray RF in your ham shack). The only adjustment that may be required is a resistor in series with the line from pin 3 of U2 to the radio's microphone audio input. This will allow you to set the deviation of the transmitter to the appropriate level. I've found that 100 ohms works quite well, but the value may vary slightly depending on the internal settings of your radio. 73

Parts List		
Qty.	**Name**	**Description**
1	C1	22 µF
1	C2	0.0 µF
2	D1, D2	1N914
3	Q1, Q2, Q3	2N2222
6	R1, R3–R7	4.7 k
1	R2	100 k
2	R8, R9	3.6 k
1	U1	4538
1	U2	LM555
1	U3	4016

Table 1. *Parts list.*

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FYI: FQY

Another look at the Fractal Quad Yagi.

Gary Schweitzer KF7BS
14641 SE 152nd
Clackamas OR 97015
[kf7bs@iname.com]

While moving several times during the last few years, I had to leave behind my previous antennas and masts. Thus, when we finally arrived at a QTH that was more or less permanent, it was time to start over from scratch. Scratch is a good term to describe my ham budget, too. I began looking for an antenna design that fit the following criteria:

1. Use of available materials at reasonable cost (free is good).
2. Small enough to fit on an easily erected mast and rotate with a TV rotator.
3. Better gain than the existing vertical antennas I already have.
4. Good directivity to limit QRM.
5. Low radiation angle to work DX.

Since 10 meters is now opening up, I decided to stick to a single band antenna for simplicity's and cost's sake.

While surfing the Internet for antenna ideas, I stumbled across Chip Cohen N1IR's Web site, [www. fractenna.com]. I was intrigued with his Fractal Quad Yagi (patent pending) because of its small size and ease of construction. I decided to put one together just to find out whether such a design had merit.

Design

As described on Chip's Web site, the 10 meter FQY is similar to a cubical quad in shape, but is in a smaller form. In fact, the elements are a little over 4 feet per side. He claims impedance to be close to 50 ohms, so it can be fed directly with 50 ohm coax. It has 3 dBd gain, front-to-back ratio in excess of 25 dB, and a bandwidth of 500 kHz for less than 2:1 VSWR.

He also describes construction of a 10m FQY built by Phil N1ZKT, using #9 aluminum ground wire (available from Radio Shack), and plastic water pipe for spreaders. I followed his construction method as much as possible. Along the way I did some work of my own, such as coming up with equations for scaling the driven element for different frequencies (like designing for the CW band). Although Chip's design was simplified to allow duplicate driven and reflector framework, I tried to enlarge the reflector and do away with a stub, although as seen in the photo, a small stub had to be added later to tune the reflector.

For purposes of folding the wires, each length between bends is broken up into segments, the total of which equals the length of each element. **Fig. 1** shows the length for each segment of 1/4 of the element, the same pattern repeating for the other three sides. Unlike the figures published on the Fractenna Web site, the figures in **Fig. 1** go from the attachment point of the feedline to where the element again comes closest to the boom, this being the logical starting point for the end of the wire. You should also note that these figures will hold for #9 wire only. Adjustment will have to be made if you are using a different wire diameter. As far as spacing between elements goes, I had available a 10-ft. piece of aluminum pipe and I figured I could experiment with different spacings. The results shown here are for 6.5-ft. spacing, wider than Chip's 4.5 feet.

Construction

The first part of building the FQY consists of fabricating a framework to hold the elements. As I had experience constructing quads, this part was fairly simple. Although spiders could be constructed of nonconductive material to keep metal away from the near field of the elements, I used aluminum, as

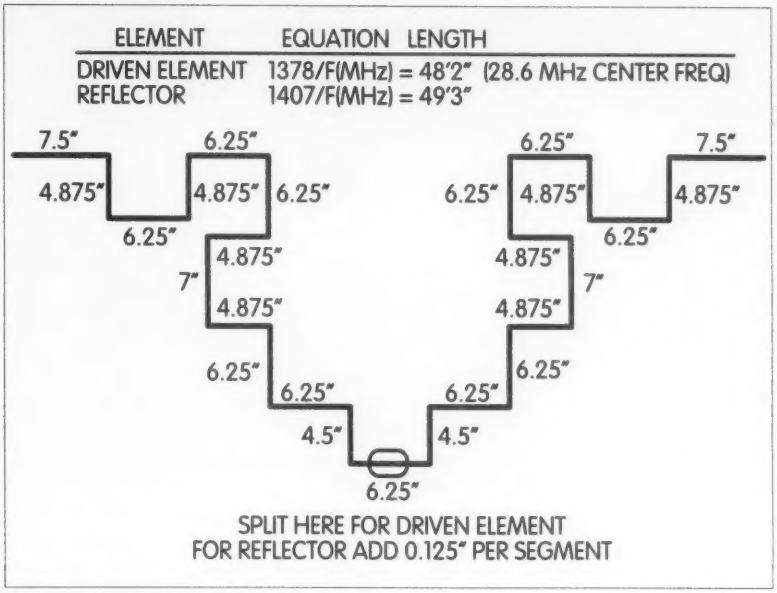

Fig. 1. Segment chart, one side (with feed).

that's what I had available. In fact, as the photo shows, some spiders are fabricated from surplus extruded aluminum from a discarded window. The spiders are drilled to accept muffler clamps the size to fit the boom, and spreaders are attached using hose clamps. You may have to cut notches as I did to allow the hose clamps to secure the spreaders tightly. Spreaders are constructed from 1/2" plastic water pipe. Cross pieces to hold the elements are then constructed from 1-1/4" plastic pipe cut to 5" length. A 7/8" hole is then drilled through the side to allow the spacer to slide down the spreader. A screw can be drilled into each spacer to hold it in position on the spreaders once the elements are mounted. A hole is then drilled in the end of each spreader large enough to pass a cable tie through to hold the outside corners of the element. An alternate spacer having a smaller silhouette could be fabricated from 1/2" plastic pipe by cutting a notch in the center and mounting to the spreader with a screw.

Once the framework is built, the elements can be bent and mounted. First, the total length of the element should be measured on the wire. If you use Radio Shack wire, it comes in 40-ft. lengths, so wire will have to be added to complete the element. Then a mark should be made at each 1/4 section of the wire. Next, a wooden block marked with the length of each bend is used to measure off the segment length and the wire is bent around the corner of the block to a 90 degree angle.

Care must be taken to bend the wire in the correct direction to form the pattern. I found that the best way to make accurate bends is to bring the center of the wire from the previous bend even

Materials List

Qty.	Item
3	40-ft. rolls #9 Radio Shack aluminum ground wire
1	bag of 100 8-in. cable ties
4	x 10 ft. schedule 40 1/2-in. plastic water pipe
1	x 10 ft. schedule 40 1-1/4-in. plastic water pipe
1	x 6 ft. aluminum angle or equiv.
1	x 6.5 ft. 1-1/2-in. aluminum pipe
4	2-in. muffler clamps

Table 1. Materials list.

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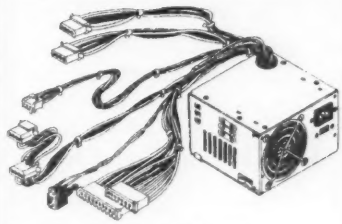

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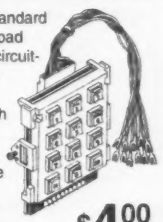

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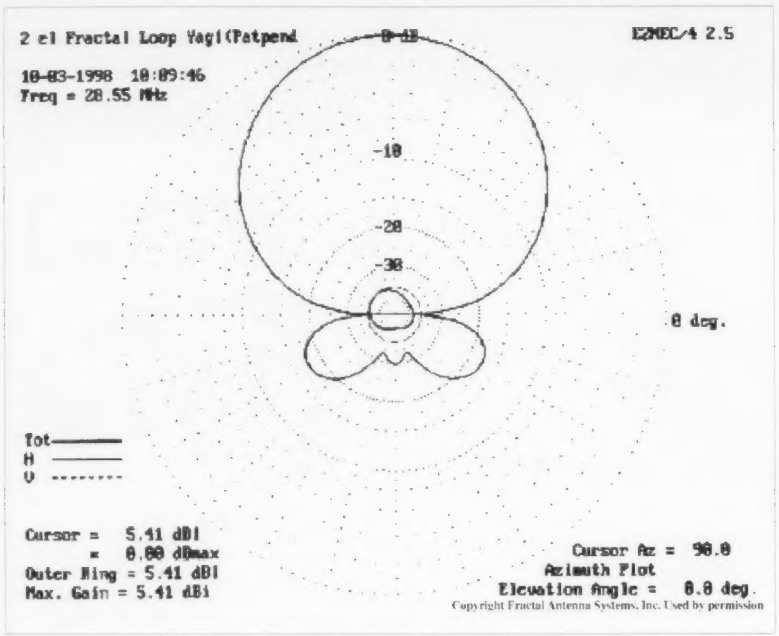


Fig. 2. Azimuth plot: Chip's free space azimuth plot. My version showed no lobes off the rear corners and a front-to-back of 12 dB.

with the mark, and then make the next bend. As the wire is bent, it will draw the previous bend forward to bring the outside edge of the wire even with the mark so that the outside edge of the previous bend to the inside edge of the next bend equals the segment length. As each quarter section of the element is finished, the mark made previously on the element can be used to judge if adjustments need to be made in bends. In this way, a full element should be able to be constructed with a minimum of rebending.

If aluminum ground wire is used, a suitable connection will be needed at the wire ends. After several trials, I settled with the method of crimping a solderless eye terminal to each end of the wire. Then connection is made with a #6 screw through the eyes and tightened with a nut and tooth washer.

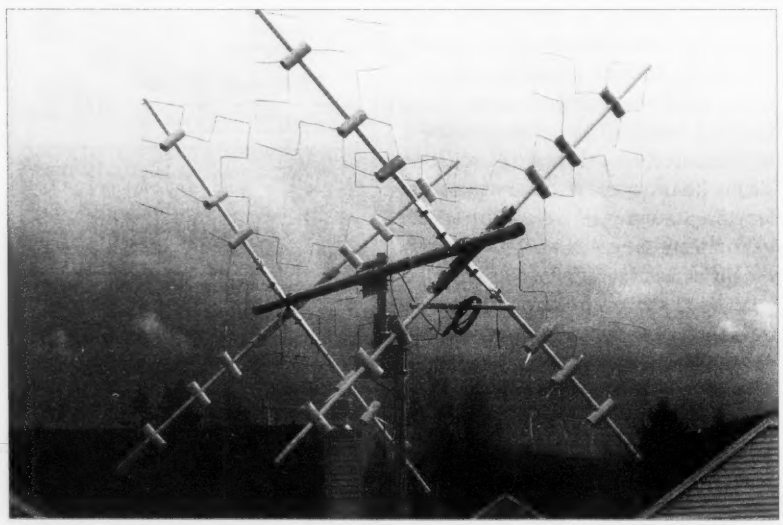


***Photo A.** The 2-element FQY mounted at the author's home. The element spacing here is 6.5 feet.*

Once the elements are completed, they can be attached to the spreaders. This can easily be done by laying the element on a flat surface and overlaying the framework. Attach the element corners with cable ties first, and then attach the rest of the corners to the spreader spacers with cable ties. Once the element is attached, the cable ties can be trimmed and the spacers locked down with a screw.

A mount at the feedpoint can be made with a piece of 1/2" plastic pipe cut to fit between spreaders and attached with screws. A balun or coaxial choke should be used at the feedpoint to prevent radiation from the feedline.

Results

With the FQY at 10 feet, measurements of VSWR were taken with the internal SWR meter on my ICOM 740. Resonant frequency was about 300 kHz lower than that shown, but bandwidth was about the same. Had I worked out the procedure above beforehand, I probably would not have had to adjust the driven element, but as this was the first attempt, trimming and rebending of wire ensued.

Tuning the reflector for front-to-back resulted in a best of 12 dB via ground wave. Chip informs me that increasing the boom length will decrease the modeled F/B and broaden the bandwidth to 800 kHz, more in keeping with my results.

A shortened boom length will increase the F/B as in Chip's version. The F/B stayed about the same with the antenna at 24 feet. It should also be noted that testing with sky wave signals resulted in a figure closer to 30 dB, actually better than the claimed 25 dB. I had no way to measure the forward gain empirically, so no figures are given here. However, recent testing by K1KW confirmed the results modeled by Chip as far as gain and F/B went, measuring against a reference antenna.

After verifying SWR and front-to-back, it was time to give the FQY the real test. How does it do on the air? With the antenna still at 10 feet, I started tuning across the band and heard VK2ARJ calling. I gave him a

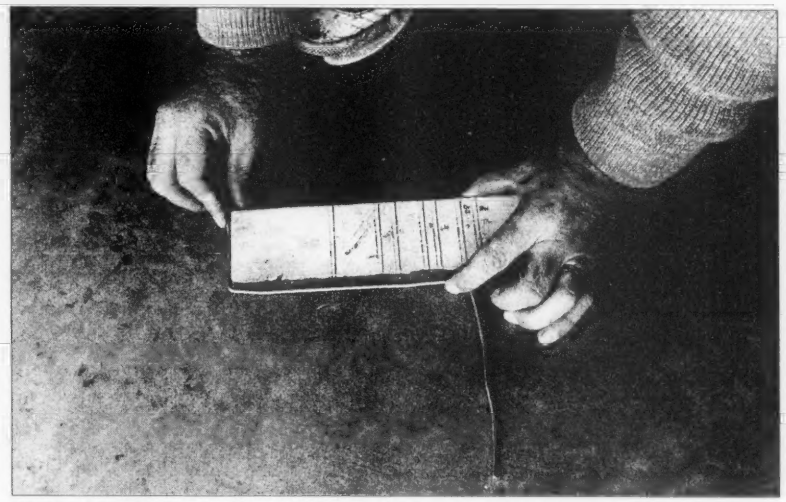


Photo B. *Bending the wire around a wooden block. The block is marked for the different length bends.*

call and got a 5-5 signal report with 100 watts. This was encouraging. After finding and fixing a used TV rotator, a 10-ft. mast was installed on the roof and the antenna mounted. This got the boom height to 24 feet.

Many contacts were made over the next two weekends, including V63KU, H4OMS, BV5BG and A35RK. I also happened to catch a rare aurora opening to Europe at 2300 UTC, working OZ1GML, GM4WJA, OZ6MI, SMØFLY, and GØMJS. Two things began to become apparent. First, this antenna seems to radiate very well at low radiation angles. In doing comparison tests with a ground-plane vertical at 14 feet with stateside contacts, very little difference is noted between the FQY and the vertical, usually less than 2 S-units, depending on condition. However when the FQY and the vertical are compared on long haul contacts, say to Australia, the FQY performs much better than the vertical, on the order of 5 to 6 S-units. Most times, a signal that can be easily heard on the FQY is a struggle to copy on the vertical.

Second, the FQY seems to transmit better than it receives on long-haul DX. I consistently receive signal reports that are 1 to 2 S-units better than I am hearing. Stateside contacts usually are about the same on transmit and receive.

Front-to-back on sky wave paths is better than measured on ground wave also. Measurements made over time indicate the F/B is well over 20 dB, most times dropping an S9+20 signal to below S5. The same signal will drop to below S1 off the sides, indicating deep nulls.

The best test came during the *CQ* WWDX contest. At one point I started at the bottom of the phone band and called every DX signal I could hear up to where the signals quit. Although I didn't work every station on the first call, I did work every station. The toughest was CEØAA on Easter Island. He had a huge pileup, with US stations all across the country calling. It took quite some time, but I happened to catch an opening as his signal was coming up, and finally got through. Many contacts have been made since, with comparable results.

	Chip's Version	Measured
2/1 VSWR	500 kHz	1350 kHz
	28.3 to 28.8	28.150 to 29.5
F/B	>20 dB (measured)	12 dB (see text)
Gain	3 dBd (modeled)	---

Table 2. *Results.*

Conclusion

I could be satisfied with this antenna just the way it is at 24 feet. It fit neatly into all my criteria listed at the beginning.

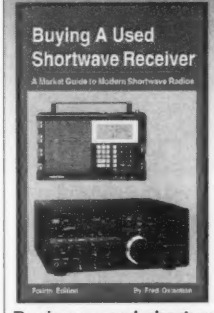
This antenna has proven itself beyond my expectations. However, for all the answers I've gotten, a dozen more questions have been raised. What would this antenna do at 35 feet? Sixty feet? Could this antenna be scaled for other bands? I already have an idea for a fractal quad loop for 40 meters. Are the results I've seen reproducible? One thing is sure: Here is a field of discovery that is open for any ham with a modicum of mechanical skill and a healthy curiosity.

Acknowledgments

I would like to thank Chip Cohen for sharing his FQY design with us hams even though it is patent pending, and for his help and encouragement in writing this article. I would also like to thank Phil N1ZKT, who first constructed the 10m FQY. His ingenuity in designing the support structure inspired me to build my own. 73

Buying A Used Shortwave Receiver

A Market Guide to Modern S.W. Radios



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Secrets of Transmission Lines

Part 3: More AC review.

John A. Kuecken KE2QJ
2 Round Trail Dr.
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In part 2, we discussed the effects of the inductor and the capacitor, with the inductor storing energy in the magnetic field and the capacitor storing energy in the electrostatic field. By itself, neither of these effects dissipates any energy. When the magnetic field of the inductor collapses and when the capacitor discharges, all of the stored energy is given back (at least theoretically, in perfect devices). If the pendulum used as an example were operated in a vacuum so that there would be no air resistance to the swinging, and if the mount and suspension did not flex, the pendulum would swing on forever. Note that this is not "perpetual motion," in that no energy or work is extracted. It is simply a system in which no (or at least very little) energy is being dissipated, just as the Earth will continue to orbit the Sun, if not forever, at least for a very long time.

If you used a plumb bob weighing 62 pounds suspended by a 220-foot length of steel music wire with a swing arc of 10 feet, you would find that the pendulum would swing for several days from the initial impulse. This was the arrangement used by J.-B.-L. Foucault to demonstrate the rotation of the Earth. The plane in which the pendulum swings would slowly rotate in azimuth. At the north pole it would make a complete rotation in a day, and at lower latitudes it would rotate more slowly, falling to zero at the equator.

The point is that there is no real power dissipated in the imaginary components of an impedance. This point deserves a little more explanation, and is perhaps best visualized by the graph in **Fig. 1.** From our part 1 discussion of Ohm's law, we saw that power is the product of voltage times current. For the alternating current, from equation (2-8):

$V = Vo*[\sin(wt)]$
eqn (3-1)

and for an inductor, from (2-11):

$i = [-Vo/(w*L)]*\cos(w*t)$
(3-2)

Thus:

Power in inductor $= -Vo*\{[\sin(w*t)]/(w*L)\}$ watts
(3-3)

The plot of this equation is shown in **Fig. 1** with the crosshatched area. To simplify, we assumed $(w*L) = 1$. You can see that, averaged over a half cycle, the power is zero since the negative part cancels the positive part. What the inductor absorbs in the first half, it gives back in the second half.

Not so the case for a resistor. From Ohm's law, we can obtain the current through a resistor as:

$i = Vo*[\sin(w*t)/R]$ amperes
(3-4)

where
R = resistance in ohms

Multiplying by the voltage to get power, we obtain:

Power $= [Vo*\sin(w*t)]*\{Vo*[\sin(w*t)]/R\}$ watts
(3-5)

Thus:

Power $= (Vo^2)*[\sin^2(w*t)/R]$

This curve is also plotted in the lower half of **Fig. 1**. Note that because the sine function is squared, it never

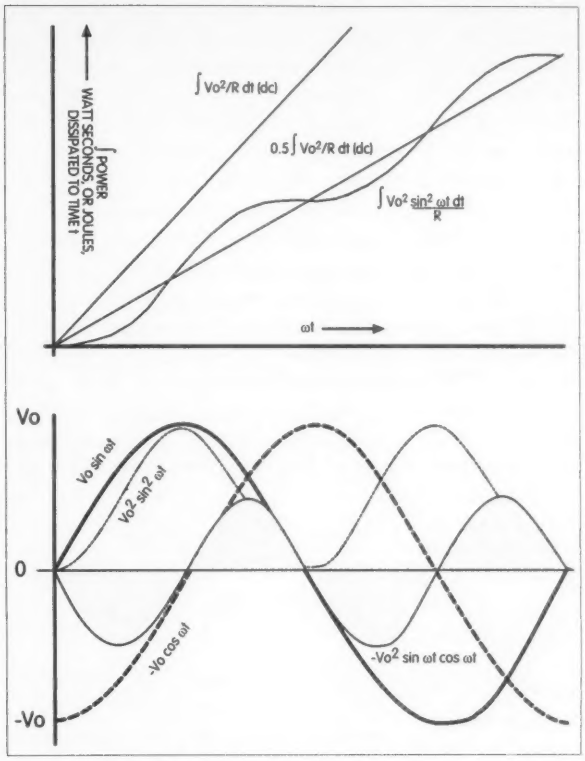

Fig. 1. The cumulative heating power with time of a resistor driven by an alternating voltage.

goes negative. This is real power that makes the resistor hot.

As shown in the $\sin^2$ curve, the instantaneous power in the AC case occurs in two peaks per cycle, one when the voltage is maximum positive and the other when it is maximum negative. In the upper half of the figure, we show how the joules or watt-seconds accumulate for two DC cases and the AC case. If the DC voltage is equal to Vo, the power accumulates faster than in the AC case; however, at 0.5 times the DC rate, the accumulation is equal on the average. If the energy were applied to a resistor or an oven, the heating would be equal. This value of voltage is termed the Root Mean Squared value, usually written RMS or rms.

$$Vrms = [sqr(0.5)]*Vo = 0.707*Vo \quad (3\text{-}6)$$

Note that this numeric relationship between the peak AC voltage, Vo, and the RMS voltage applies only to sine waves; other waveforms have other relationships.

A similar relationship can be used to show that a similar effect applies to a capacitor. The current flowing in the capacitor represents no real power.

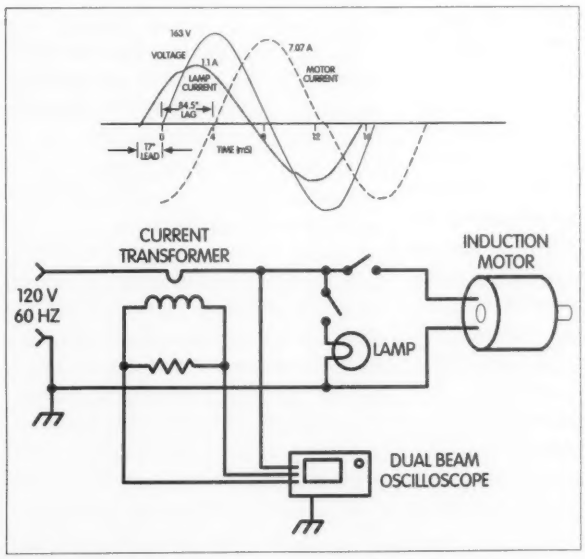

Fig. 2. Current and voltage monitoring of an induction motor.

Power factor and phase angle

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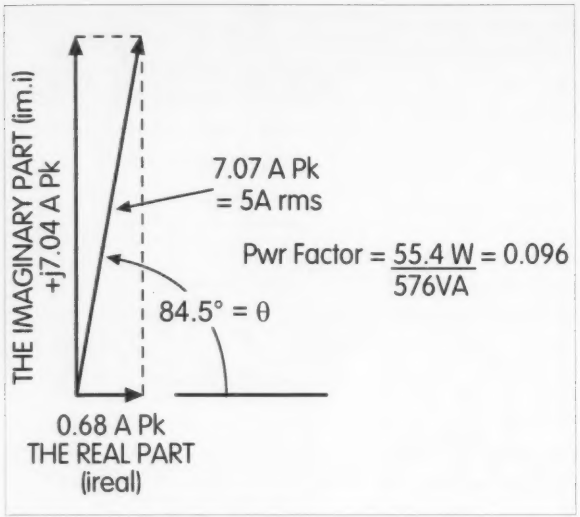

Fig. 3. The vector diagram.
Eqn (3-7) ipeak = irms/0.7071
(3-8) 0.7071(7.07) = 5 Arms
(3-9) ix (real) = ix cos θ
ix (imaginary) = jix sin θ
(3-10) Power (real) = irms (real) Vrms watts
Power (imaginary) = irms (imaginary) Vrms VARs
(3-11) Power (real) = 0.7071 (0.68) x 0.7071 (163) = 55.4 watts or 0.074 horsepower
Power (imaginary) = 0.5 (j 7.04) 163 = 574 VARs

the inductor and capacitor simply exchange energy without loss, does not exist. Let us examine a simple practical case. The curves of **Fig. 2** represent measurements made on equipment in my shop. The motor and lamp are both on a drill press.

The motor is rated at 1/3 horsepower and the lamp is rated at 100 watts. For the data in the illustration, the motor is more or less loafing, just turning itself and the tapered roller bearing quill in the drill press. In all likelihood, the main power loss is in turning the belt.

We will describe how to make the current transformer later. Suffice it to say here that the transformer can be calibrated to read so many volts per ampere and the phase angle is zero. That is, the output voltage is precisely in phase with the current (not the voltage) on the line under measurement.

Both current waveforms are slightly distorted from perfect sine waves. In the case of the induction motor, the distortion is at the crossover point and probably due to hysteresis effects. In the case of the lamp, the distortion is due to the fact that the resistance of the lamp changes throughout the cycle due to heating effects.

With a dual-trace scope, we can compare the voltage, current, and phase angle between them. The peak voltage on the line is 163 volts. Multiplying by .707 to get RMS, we obtain 115 V, which looks more familiar. Similarly, the 7.07 A peak current yields 5 amperes RMS. If we had only the voltmeter and the ammeter, we might be tempted to multiply these together to obtain 576 volt-amperes.

Referring to **Fig. 3**, we see the resolution of the currents and voltages. In equations (3-9) and (3-10), we resolve the current into the real part which is in phase with the line voltage and the imaginary part which is 90 degrees out of phase with the line voltage. At the bottom, we calculate the horsepower on the basis of 746 watts per horsepower. The power factor is simply the real power divided by the total volt-amperes.

The 0.074 horsepower does not seem to mesh very well with the 1/3 horsepower on the motor nameplate. We noted that the motor was idling. As you start to do some real drilling, say, using a half-inch drill in cast iron, the current creeps up slightly to 7.8 amps peak with a phase angle falling to 68 degrees. This gives a real current of:

i = .7071*7.8*cos(68)
i = 2.07 amperes RMS

Power is:
P = .7071*163*2.1 A
P = 238 watts = 0.319 horsepower

This is a little more in keeping with the 1/3 horsepower label. Note, however, that the Rochester Gas and Electric Company is supplying me with 7.8*115 = 899 volt-amperes, while the wattmeter is only billing me for 238 watts. There is nothing imaginary about the reactive volt-amperes. They heat transformers and wires just like the "real" power. The lamp draws leading current like a capacitor. This is because the lamp resistance goes up after the initial flow of current, so it tends to shut down before the peak of the cycle is reached. Because the phase angle is only a minus 17 degrees, the real part is:

irms = .7071*1.1*cos(17)
irms = .744 amps RMS

Power = 115.25*.744 = 85.72 watts

This is not so far off the target of the 100 watts listed on the bulb. Also, we used an RMS correction to apply to a distorted waveform. The power factor for the lamp is:

Power factor = 85.72/89.64 = 0.957

Much of the work to be done in impedance matching will be simply a matter of trying to correct the power factor of the load for efficient transfer of power.

Power factor correction

Let us suppose that we wanted to correct the power factor of the drill press. At no load, we see that the imaginary current is:

iimag = 0.707*7.07 amp*sin(84.5)
iimag= -j4.98 A RMS

Now, if we were to supply a capacitor that would draw +j4.98 A RMS, the capacitive current would cancel the inductive current and the power line input current would fall to 0.68 A RMS. From formula (2-18), we have:

iimag = V/Xc
Xc = 115.25/-j4.98 = -j 23.14 ohms

but

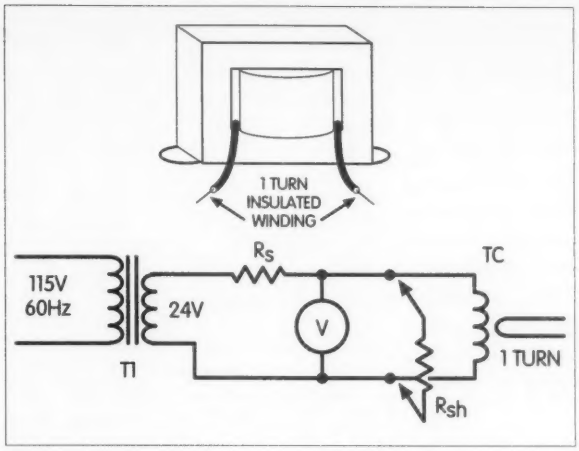

Fig. 4. The current transformer, and finding Rsh value.

1/Xc = j0.0432 mhos = w*C = 2*pi*60*C

C = 0.0001146 Farads or 114 microfarads

This is a fairly large size for a capacitor that can handle 163 volts peak AC; therefore, power factor correction is rarely attempted on small machines.

Power companies can rely upon the diversity of their loads to smooth out the power factor, but a radio antenna system cannot. It must be impedance-matched if any reasonable transfer of power is to take place.

The current transformer

The current transformer shown in **Fig. 2** makes a worthwhile project for this chapter, and it is also a handy thing to have around the ham shack. Furthermore, it will teach us some valuable lessons about radio frequency measurements.

The current transformer can be made from nearly any transformer. For convenience it should be small, but the main requirement is that there be enough room to sneak a wire through between the winding and the core.

This is illustrated at the top of **Fig. 4**. The wire passes between the winding and the core, around the back, and out the other side. The wire should be insulated and of a size capable of handling the number of amperes you expect to measure. Do not use varnish-insulated wire, since the voltage rating of this wire is too low and the varnish may be scratched through when pulling the wire between the winding and the core.

Teflon-insulated hookup wire normally has a rating of 600 V if the insulation is about 1/32-inch thick. Remember that the voltage-to-ground of the circuit whose current is being measured will appear on this wire, and you may be handling the core and attaching the trans- former to a grounded oscilloscope.

As a simple guide to wire size, a #16 wire is safe at 15 amperes. If the space between the winding and the core is too small for this, two #18 or four #20 wires wired in parallel will also serve for 15 amperes. For other ratings, you can look up the area of the wire on a wire table and assume that you can run 1000 amperes per square inch of wire cross-section. This rating accounts for heating in the transformer and is on the conservative side.

The next thing to do is to find the correct value for a shunt resistor. At the bottom of **Fig. 4**, you will see a circuit hookup. The 24-volt transformer is used as a safety measure to isolate your setup from the power line. The specific voltage used is not important; however, 24 VAC is a safe level with which to work, and 24-volt transformers are widely available. Pick a value of Rs such that the voltmeter reading is about 10% of the T1 output voltage reading, with the circuit connected, except for Rsh. If we assume that the transformer you picked out for TC is a 115 V to 24 V variety rated at perhaps 1 A output, the value of Rs will work out to be about 10k to 12k ohms. The power being dissipated in this resistor will be somewhat less than 24*24/10000 = 0.056 watts.

Now what we need is to find a value

Continued on page 26

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Secrets of Transmission Lines

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of Rsh that will reduce the voltmeter reading by a factor of about 10. It is important that transformer TC have no load on any secondary windings. To do this, simply clip various values of Rsh across the winding and observe the voltmeter reading. When the correct value of resistance is found, solder it in place across the winding of TC.

We have been talking about the fact that the voltage drop across an inductor is in quadrature with the current, and in fact, if the voltage drop across the winding of TC is 10% of the output voltage of T1, then the phase angle of the current in TC will be only 5.7 degrees.

Without belaboring the math too much, when the winding is shunted by Rsh such that it reduced the drop across TC by a factor of 10, an interesting thing happens. The ratio of the currents in the single turn winding and the current in the secondary is given by:

Ist/I2 = (j*w*M12)/(Rsh+j*w*L2)

where

Ist is the current in the single turn winding in

I2 is the current flowing through Rsh and L2

M12 is the mutual inductance between the windings

L2 is the self-inductance of the winding shunted by Rsh

Now, if w*L2 is greater than Rsh, then we may neglect Rsh. The j*w in the numerator and denominator will cancel, and:

Ist/I2 = M12/L2

There are a couple of important things here. First of all, we note that the currents are in phase. Secondly, we see that the ratio between the primary and secondary is independent of frequency — the j*w terms have canceled out. The output voltage will be:

Vout = I2*Rsh

Now, you will probably not know the value of M12, so the ratio of the current in the single turn winding to the output voltage is best determined experimentally. If you have or can borrow an accurate AC ammeter, you can pass currents through the single turn winding and measure the voltage drop across Rsh. If you have a variable voltage source like a variac or a multi-tap transformer, you can use a single resistor. If you have only a single voltage source, you can use resistors of different resistances to obtain several calibrating currents.

The power dissipated in Rsh is:
PD = (Vout*Vout)/Rsh

This can be substantial, and Rsh should have a wattage rating that is conservative. Note that if Rsh should open up or fall off, very high voltages can be generated in L2 or other windings on the transformer. Also note that any other secondary winding can have a substantial voltage on it.

Since the single turn winding must interrupt the circuit and power line voltages are liable to be found on it, it is well worth it to have sturdy terminals to attach to the single turn winding. I have found it convenient to place the transformer in or on a conventional electrical box, and to wire the single turn winding between a conventional outlet and a conventional plug. With this arrangement, an appliance can simply plug into the box, and the box can plug into a wall outlet for current measurement without cutting any wires.

If you have an oscilloscope, the current transformer can be used to show waveshapes and phase angles.

The cancellation of the j*w terms would imply that the frequency response might extend indefinitely. As a practical matter, the frequency response of the device is probably a function of the thickness of the core laminations. With standard 0.015-inch core laminations, the response will tend to fall off at frequencies in excess of 400 Hz or so. As we shall see later, a current transformer with a ferrite or powdered iron core is a significant part of most directional couplers, VSWR meters, and automatic tuners. 73

To be continued.

NEVER SAY DIE

continued from page 4

with the Center for Disease Control and Prevention in Atlanta, and the State Research Institute of Virology and Biotechnology, outside of Novosibirsk in Siberia.

That's okay, too, except for some recently leaked classified reports from Russian scientist defectors who reported that while we have a few ounces of the virus, Russia has built up a stockpile of 20,000 tons and has been testing missiles with refrigerated spray biological warheads on their giant SS-18 intercontinental missiles that are targeted on the US.

There are worries that they might even sell some to North Korea, which could lob some over on Japan and virtually wipe out the country. North Korea recently fired a missile over Japan and into the Pacific, just to let the Japanese know they can do it any time they want.

As I've reported, there are somewhat less reliable reports that Iraq has built up over a hundred 11-person cells around the US that have been brewing anthrax, waiting for the command from Saddam to spray it in our major cities and from crop duster planes on smaller cities, with the goal of killing over half of all Americans in a few days. The scary part is that this is a fairly simple scheme to carry out, and we know that our government would never tell us about it since there is so little they can do to prevent it.

Is there anything you and your family might be able to do? Of course there is, as long as you don't tell too many people. The supplies of gas masks and protective clothing are scanty, so if more than a few hundred people go after them, that'll be the end of that. But since you pay almost no attention to what I write and recommend, I feel safe in writing about it here.

I've published two construction articles on the bioelectrifier. You are supposed to be an electronic hobbyist, so putting one together should be duck soup for you. But you haven't done it. If you don't have the back issues with the projects, you can spend $10 for my Bioelectrofier Handbook, which has a reprint of the Miller article, along with the original Beck blood purifier circuit. The parts cost under $20. If you are electronically challenged you can buy a Plant Growth Stimulator which, by an amazing coincidence, has the same circuit. It also includes a colloidal silver generator, complete with pure silver wires. It's $155, including shipping, from Butterfly Products, Box 1729, Hillsboro NH 03224.

The bioelectrifier is supposed to clean any virus, microbe, yeast, fungus, or parasite from the blood. It does seem to be

working miracles — I had a nice letter yesterday from a woman who said that her doctor couldn't believe her latest x-rays. Her cancer was completely gone!

My greatest pleasure every day is in reading letters from people I've helped. Like the one from Carl Maggio, who wrote, "I feel like a different person, with all my aches and pains gone. I've lost 10 pounds, the last 10 pounds that I couldn't get off no matter what I ate or did exercisewise. I look younger than I have in years and feel better than I ever have. My digestion system is no longer giving me problems and I now weigh what I did in high school."

You will want to be able to make colloidal silver, which is a powerful antibacterial agent.

You might want to look into gas masks, too. Call (618) 655-0383, (800) MSA-222, or (800) 866-4876 for further information. They may have protective suits, too. For Tyvek coveralls with a hood, try (800) 362-1000 and (800) 543-8955.

Or you can wait and see what develops. If the Dayton HamVention is still around in 2005, I'll be there to celebrate the 50th anniversary of my first HamVention and you can poke fun at me for being a worrywart.

Home Power

The TV magazine shows have finally started pushing Y2K nervousness. It started in May with a *60 Minutes* interview with the woman in charge of Y2K for Washington DC. She admitted that there is a good possibility that the power grid could go down for a few days to even a few weeks. I think reality is finally beginning to soak in.

So what does this mean to you, oh great communicator? It means that if the power goes down, taking with it the telephones, and probably the satellites too, about all communities are going to have left are some CBers, with very limited range, and you, brother ham. That's assuming that you've bothered to upgrade so you can use the HF bands and talk to more than someone over a probably now dead repeater. How many repeaters have emergency power systems so they can keep going indefinitely when the power companies are on an extended vacation?

Art Bell W6OBB has put in a whopping solar power system, plus a windmill. I don't think there's anyone in the country who is more knowledgeable about the potential Y2K problems than Art. He's interviewed all of the top experts on his show. In depth. And Art is sincerely worried by what he's learned.

Okay, so what should you get to keep you on the air when the lights go out? A car rig is fine. Or, at least it will be for a day or two. But with the power off, gas pumps won't work, so you'll soon run out of gas. You're going to want to think in terms of solar and wind, just as Art has. And that means that you're going to spend $22.50 and subscribe to *Home Power* magazine, Box 520, Ashland OR 97520, (800) 707-6585. It's edited by Richard Perez N7BCR. His whole crew are hams, and their offices are solar-powered. His magazine is packed with great articles on home power systems. Plus ads you'll want to see.

Yes, Another Y2K Update

Well, you've been easing off on your preps, so you need a jolt of reality.

For instance, Senator Bob Bennett, who not long ago opined that Y2K might be just a bump in the road, now says, "How high that bump will be, how radical it will be, I don't know." He further said, "there will be an economic consequence to Y2K," and told Americans to "take care of your own life" when it comes to personal preparations.

Bennett indicated that the government will be increasingly encouraging people to be prepared for local failures, which could easily add up to "an interesting problem on your hands." He indicated that making serious precautions would not be an overreaction.

So, are you set with a dependable water source, enough food to carry you and your family for several weeks, some way to keep warm, protect your home, and so on?

Has your local club been organizing an emergency communications system?

Music Heals

Yeah, I was ahead of my time again. Big surprise. Back in 1951 I became the General Secretary of the Music Research Foundation, with offices on Madison Avenue in New York. Well, a good RTTY ham friend of mine, Graham Claytor, was the vice president of Pacific Gas and Electric, so we got to be friends. He knew of my background in music and psychotherapy, so he introduced me to the wife of the president of the company and the next thing I knew I was running the Foundation.

I enjoyed the work, which meant organizing conferences of the leading psychotherapists (psychologists, psychiatrists, psychoanalysts) for monthly meetings. I also got busy and wrote a book, *Music For Your Moods*, which the Foundation published, complete with the usual cocktail party publication party.

Okay, now that the bragging is done, let's come up to date. It turns out that music can have a profound effect in helping people recover from stroke, provide improvement for people with Alzheimer's and Parkinson's, and so on. Mozart before an IQ test, according to

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researchers at the University of California, Irvine, boosts scores an average of 9 points.

Scottish researchers found that a daily dose of Mozart or Mendelssohn significantly helped stroke victims. In Cleveland, it was shown that it could boost the immune function of children. Preemies exposed to lullabies in the hospital went home earlier. Well, you get the picture.

Okay, now let's talk about you. You can substantially improve your body by listening to some music every day. It'll help reduce your stress, and that, in turn, will pep up your immune system, as well as make you easier to get along with. Stress is a killer, as you know. So what are you doing to reduce your stress level?

One reason a few minutes of meditation every day helps so many people is that this also helps reduce stress.

Classical music, if it's really good, which unfortunately most isn't, can work wonders. Of course, if you have never been exposed to classical music, it may be a little late to develop a love of it. Even Mozart turned out some stinkers, so if classical music is new to you I have a $5 guide which will help you find the really outstanding music. It explains which are the best of Mozart's symphonies, Beethoven's, and so on. It'll also help you find some of the more hidden gems of classical music such as the music of Gottschalk, Nazareth, and Joplin.

But no matter what kind of music you enjoy, allow some time every day to turn it on.

If you start getting interested in building a CD library, other than classical, you'll benefit from the Adventures In Music CD samplers I have available. Each one has the top-rated tracks from about 15 different independently produced CDs, and they cover most kinds of music. At $3 a pop, you will never find a source for better music at such a price. Send an SASE for my Adventures In Music catalog. I've got 83 different samplers in stock — while they last. An SASE will bring my catalog.

$100 Billion

While you've been sleeping, your Congress, ever generous with your money, has budgeted $100 billion for the space station. NASA is busy working on the project, with one US-built section already in orbit, connected to a Russian section. What they don't have is any good reason for this project, other than scientists' and the rocket industry's welfare. And that $100 bil is just today's estimates. Insiders are predicting it'll probably cost at least double to triple that. And what project hasn't?

Hmm, let's see, if we divide $100 bil by 200 million taxpayer families, that's $500 out of your pocket for this extravaganza. Well, heck, that's only about a week's work, so who cares, right?

There have been some little problems with the hardware they already have lofted. It seems that the navigation controls for the station are in the Russian part, and when there was a danger of a collision with some other space debris they found that the control system didn't work. Repair crews have had to be sent up to try to solve some of these problems, and to fix parts of the Russian unit that were found to be defective but which weren't discovered before launching their part of the station.

Once they've got it up there, other than a few experiments which could easily be done in a much smaller and less expensive facility, there's been little commercial interest in the project.

The Space Station

Like the super collider, which thankfully Congress finally scuttled, I view NASA's space station project as little more than another scientist welfare program. NASA has no clear rationale for the pro- ject. They spent $20 billion before one piece of hardware had been lofted into space for it. So what do we have? A bigger, better *Mir!* And what benefits has *Mir* provided? Some ham radio contacts and lots of news coverage of its endless woes.

The original space station idea was to have a platform in space from which to keep track of what was going on in hostile countries and to be able to dump nukes on them when they got too uppity. But all that's been made irrelevant by our spy satellites and missile delivery systems.

Well, how about a scientific laboratory in space? We've been doing scientific work in our temporary space stations known as orbiters. If anything of value has come of that NASA has managed to keep it under wraps — something that NASA is not famous for doing, unless it's bad news.

So what is the rationale for spending billions on NASA these days? It's an expensive agency with thousands of employees and no clear mission. It's mainly been ferrying satellites into orbit for the military, a bunch of black projects, and communications companies. There it's in competition with the French, Chinese, and Russians, who are providing discount rides for the same customers.

Oh, NASA is still mumbling about sending astronauts back to the Moon or even to Mars, but until they can convince me (and almost anyone else who's seriously looked into the matter) that they didn't have to fake the Moon landings 30 years ago, I think we could save billions by re-issuing the movie "Capricorn One" and making do.

The array of satellites in near-Earth orbits have revolutionized communications for us, so we've benefited from that program and the space shuttle. But, given the lack of any good reason for lofting the space station, would you voluntarily donate $500 out of your pocket for the project? Secondarily, do you have any objection to Congress grabbing the $500 out of your pocket via the IRS's long arm, whether you like it or not, and putting you in prison if you refuse to pay? Stop mumbling about well, gee, somebody ought to do something about this, but you're too busy.

Still Smoking?

A medical school research study of 9,223 non-demented seniors in Rotterdam found that smokers showed a much greater decline in memory and other cognitive faculties than did non-smokers. So, in addition to smokers losing their sex drive in their 40s, and heading toward emphysema, cancer, or a heart attack in their 60s, they're also going to lose their memories and ability to think. So how much is all that going to cost businesses in government-mandated health insurance?

My dad smoked Camels and there was nothing I could say to stop him. When he was in his 60s he started passing out. *That* convinced him. But his last 20 years were a nightmare of emphysema, heart trouble, fainting, and so on. For most of those years, he had to have an oxygen bottle with him 24 hours a day, but even so, he could only walk a few feet before having to rest. So yes, I am a real nuisance when I see some stupid kid smoking. I don't believe a kid with any intelligence these days would get started with a nicotine addiction.

My grandfather was a brilliant inventor. It was his inventions that founded Citgo, whose gas stations you see everywhere. But he smoked, so his lungs had no stamina and he died in his 50s of pneumonia.

When I go to the reunions of my old submarine buddies I now see that very few of the smokers are still alive. Indeed, quite a few of them started dying around 20 years ago, mostly from smoking-related illnesses.

AARP

Now that most hams are senior citizens, they might want to take a good look at *Trust Betrayed* by Dale VanAtta. He exposes the AARP excesses. Like the $16,000,000 a year they pay in rent for their Taj Mahal HQ building. The head guy makes $287,000 a year, plus $49,000

for expenses. They have over 1700 employees, of which 6% are over 60. And so on. Read the book and you'll have a lot to talk about the next time you contact a retiree, which seems like the case most of the time these days.

Mooning

A lovely ad for a three-volume set of books commemorating the 30th anniversary of the Apollo flights came from Time-Life books. $65 for the three volumes normally, but special, for me, $50. Wow! It's a lovely mailing piece, with an 8-page full-color insert.

My goodness, we were able to make nine lunar (and six landing) trips 30 years ago, and here we are 30 years later, with far, far more advanced space and computer technologies, and still we've never been back to the Moon! We haven't even gone on to Mars, except in the movie "Capricorn One."

For those readers who are convinced that Uncle Wayne is crazy for believing that NASA's Moon trips were all faked, and who have supported that conviction by not being interested in doing any of the research I've done which forced that conclusion on me, this set of Time-Life books will help perpetuate the myth.

It was René's $25 *NASA Mooned America* which forced me to accept that I'd been hoodwinked by the second biggest government lie in history. Have you read the book yet? Or are you so totally brainwashed that you would prefer not to be confronted by this exposé? As with *Dark Moon*, I think I'm the only source for these books, but if I suddenly have a heart attack or a stroke, I hope you'll suspect that I got into trouble for messing around with things I shouldn't. I notice that the whistle-blowers Art Bell has been giving air time to are mysteriously dropping all over the place. The CIA knows how to induce these things.

Between these two excellent books, plus the further data from Bill Kaysing's *We Never Went to the Moon*, and a bunch of supporting letters from readers who worked for NASA or their suppliers, the evidence that the Apollo missions were faked is conclusive.

More Mooning

Dig out your July 19th copy of *Time* and turn to page 68, where they have a two-page photo spread supposedly taken on the Moon. Yes, I know you don't want to believe the Moon landings could possibly have been faked, and I don't blame you. But get out that issue of *Time*, take a look at the Moon photograph, and answer these questions for me.

(1) With the Sun as the only source of light, how come the shadows cast by the chap in the foreground is going one way and the shadows cast by the Rover and nearby rocks are about 120° in a completely different direction? Two Suns?

(2) Professor Fred Whipple of the Smithsonian Astrophysical Laboratory in Cambridge, Mass., claims that dust particles will become tightly packed, making a concretelike surface, unless there are some gasses (like air) to filter in between and separate them. This was confirmed by David Bowen at the North American Aviation Company, who put fine dust in a container, evacuated the air, and then dropped a steel ball into it. The crust was solid and the ball didn't even dent it. Thus, the astronauts, who weighed about 65 pounds with their suits and backpacks, should not have been able to make any boot marks or get any dust on their suits. Nor should there be any Rover tracks. There's not supposed to be any atmosphere at all on the Moon. If they'd found one there, that would have been front page news. That would also have meant that the Moon would have to have a much stronger gravity, or else the atmosphere would have long ago dissipated into space.

(3) One thing astronauts in low Earth orbit have always commented on is how incredibly bright the stars are once they were beyond our atmosphere. There is not one star showing in the photo. Or in *any* other Moon photos.

(4) How come the ground nearby is a much darker gray than the hills in the background? Shouldn't everything be the same color? And note that there are rocks in the foreground, but none in the background. The background looks exactly like a scenery backdrop. It ain't real. I used to be the Chief Cameraman at WPIX in New York and then a TV director in Dallas and Cleveland, so I know a set when I see one.

(5) Now take a look at the Rover. How did NASA get that big, heavy thing up there? The LEM is made with thin foam plastic walls, covered with inside and outside layers of 0.001-inch aluminum foil. No matter how they attached Rover to the LEM it would throw it way off balance, making it spin when the landing rocket was fired. And then how did the two astronauts manage to get it down from where it was suspended? NASA has refused to answer questions on how or where the Rover was attached to the LEM. Or any other questions about the Apollo trips.

That Belt

Tesla predicted that there was a high energy belt around the Earth that was shielding us from most of the Sun's high energy radiation. He was, of course,

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ridiculed by our leading scientists for proposing such a preposterous theory.

In the late 1950s our government spent millions sending up high altitude balloons, which then launched rockets into space with Geiger counters. They confirmed the Tesla predictions, now called the Van Allen Belts.

The first experiments puzzled scientists because the Geiger counters reported higher and higher radiation, and then suddenly it dropped to zero. They then sent up a lead-shielded counter, which confirmed that the radiation was enormously higher than predicted.

Indeed, the SST carries a radiation counter, and when the count reaches 10 millirems the SST has to go to a lower (and less efficient) altitude to protect the passengers and crew. Experts consider 25 rem as being the maximum possible lifetime radiation dose, so the 10 to 100 rems per hour in the Van Allen Belt, which takes a rocket ship about an hour to navigate, would likely kill any unprotected astronauts.

Then, in addition to the high level of radiation in the Van Allen Belt, there are the solar flares, which average about 15 a day. We're talking about 369 rem, enough to kill almost anything. In *Prospects for Interstellar Travel*, John Mauldin claimed that at least six feet of lead shielding would be needed to protect anything living.

The Moon has no radiation belt protecting it, so the full force of the solar flares hit its surface. Now, remember that the LEM was made of foam plastic sheets covered by two layers of aluminum foil.

According to Van Allen, the exposure for any astronaut going to the Moon and back would have to have been between 60 and 240 rem. None could have survived.

RTTY '99

While I was answering my E-mail this morning, two hams broke in to rag chew. Déjà vu. It was just like RTTY in 1949, when I got involved and built my interface unit. It was the fun of being able to type back and forth with the group on 147.96 MHz in the greater New York area that got me started in ham publishing. It was so much fun that I just *had* to share my fun with as many other hams as I could.

I tried to get John Williams W2BFD, the father of ham teletype to do a newsletter, but he was "too busy."

We had about 30 of us on the channel, using a repeater John and I set up on top of the Municipal Building in downtown Manhattan. I've written about me installing the antenna in the middle of the night on the sloping copper roof in the middle of a snow storm. Well, it was at the beginning of a VHF contest and I wanted to get the station on the air and make some contest contacts.

Our Teletype machine controllers let us turn on the machines of anyone in the group and leave messages. Their transmitters would then give a beep-beep signal to let us know that the message had been received. Like Fax today. I used to leave my machine turned on when I'd go downtown for a few hours and I'd come home to a printout of yards and yards of messages exchanged among the gang.

Like today with our computers, where we can send attachments, I had a bunch of documents saved on punched tape that I could put on at any time to tell a story or explain something. And all at 60 wpm.

It was when I went to work for WXEL-TV in Cleveland in 1951 as the director of their live programming that I started *Amateur Radio Frontiers*. Well, they had a mimeo machine sitting there that I could use at night. That magazine grew to 32 pages over the next four years.

Anyway, the fun of the old RTTY days is back via the Internet. And no QSLs required!

Little Boy

That's the code name for the bomb we dropped on Hiroshima. For the first time, as far as I know, the inside story of the development of the atomic bomb and the decision to drop it on Hiroshima has been told. The book, *The Angry Genie*, by Morgan and Peterson, explains in detail the development of the bomb and the political maneuvering that resulted in it being used on Hiroshima and then Nagasaki.

President Truman was in favor of the bomb being used in a remote Japanese island as a demonstration of its power as a way to get the Japanese to surrender faster. The Japanese were already discussing surrender terms, but Army General Leslie Groves wanted to find out what the effect of the bomb would be on a city. He also wanted to find out what the difference would be between the destruction of cities between the U-235 atomic bomb (Little Boy) and the plutonium U-239 (Fat Boy) bombs, so he wanted to test the bombs on two Japanese cities.

Secretary of War Stimson and Secretary of State Byrnes also were in favor of using the bomb on a city as a "diplomatic master card" in the relations with Stalin.

Meanwhile, 67 scientists involved in making the bomb signed a petition

Continued on page 58

The History of Ham Radio

Parts 1 and 2: From the birth of the wireless age to 1920.

By Eric G. Schalkhausser W9CI, SK

When trying to get just a glimpse of wireless history in a nutshell, it is traditional to lay most emphasis on the years from 1910 and on. This period coincided with radio rules and regulations, the three R's, being formulated by the United States government. We then project the general accumulation as far as 1927–1928, after which time some degree of order was again established in the radio industry, overall.

In telling our story, it is impossible to refrain from making pertinent insertions of interest. There were many occurrences during those early years that stand out vividly in memory and need telling. Those beginning years were mostly of pioneering and exploring, bringing forth many discoveries and inventions in rapid order, in very short periods of time.

1909

To begin with, let me set the year 1909 as a reference. Why 1909? We will become aware of the reason as we review the history in relating the *magic that is wireless.*

Adapted from *73 Amateur Radio,* March and April 1977, where portions of this were originally reprinted from *QCC News*, a publication of the Chicago Area Chapter of the QCWA.

And it sure was magic to everyone in those days, believe me! Let me take a short glimpse into the past history of wireless. There were no laws on the books. There were no rules or regulations pertaining to wireless. The general public was not even aware that radio waves existed. They had no inkling of what was meant by communicating without wires. Practically nothing was known about electricity. All this was a mystery.

1888

In 1888, just 89 years ago [in 1977], a German scientist made a discovery when he sensed that there was something present in the vicinity of an electrical spark in a Leyden jar discharge. This elementary discovery made by Heinrich Hertz set the stage for many scientific investigations. They were carried on in university laboratories, stimulating research in the field of electromagnetic waves.

1892

About this time, along came Marconi from Italy. He was born in the year 1874. At the age of 18, while a freshman at the University of Bologna, Marconi discovered that an electric discharge from a condenser could be detected. This made possible the transmission and reception of signals over some distance. Playing around and experimenting for four years, he finally went to England, where he demonstrated his finding and equipment.

1896

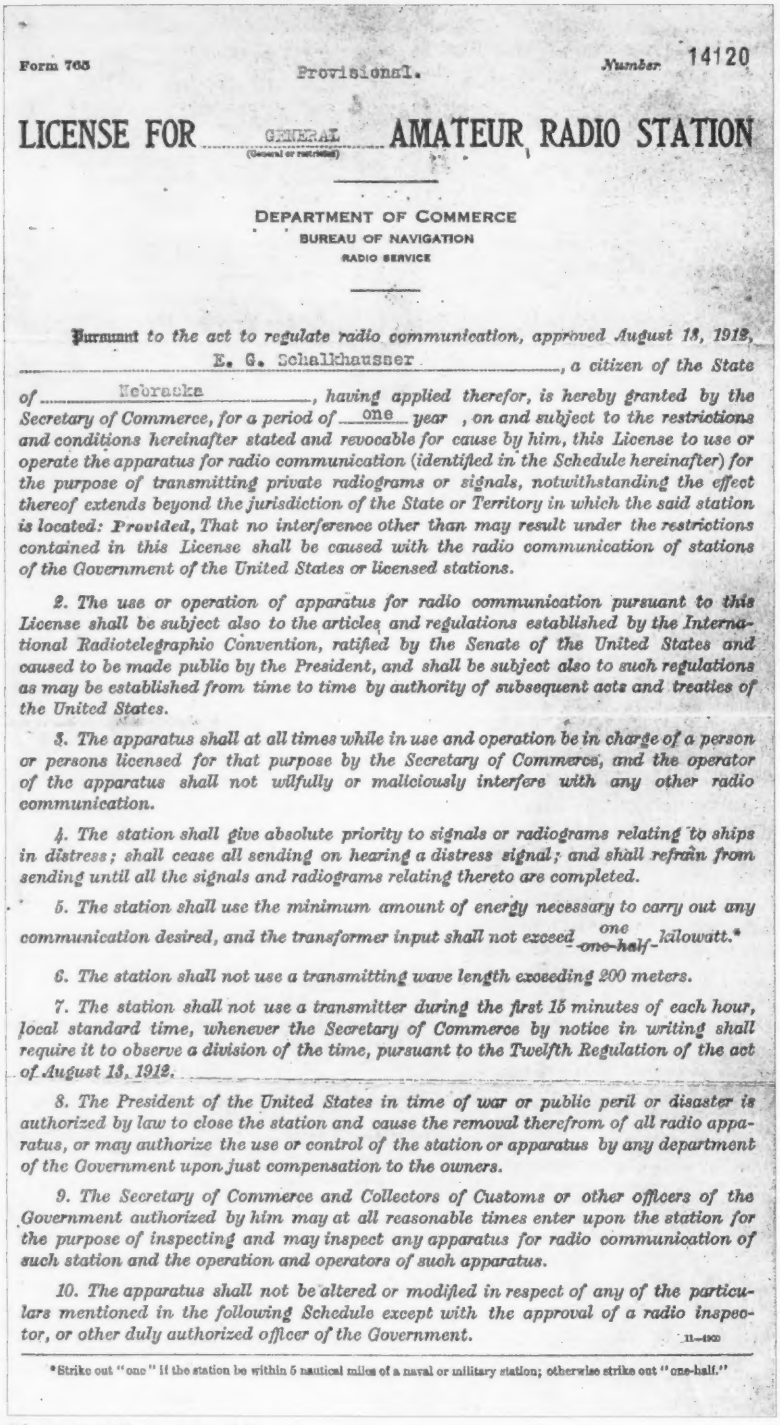
In 1896, Marconi obtained a British patent for *wireless telegraph apparatus using electricity.* How utterly novel and primitive that description sounds today. And that was only eighty-one years ago [in 1977]! (At that time I was 3 years old, but do not recall the incident!)

1897

Within a year, commercial interests became aware of the possibilities in the application and use of Marconi's invention and organized the Wireless Telegraph and Signal Company, Ltd., in England.

1899

In 1899, Marconi and his assistants succeeded in sending signals across the English Channel with their crude equipment. The main bottleneck was their iron filing coherer for detection of signals. The use of galena, silicon, or carborundum was not yet known for



Form 765 Provisional. Number 14120

LICENSE FOR GENERAL (General or restricted) AMATEUR RADIO STATION

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
RADIO SERVICE

Pursuant to the act to regulate radio communication, approved August 13, 1912, E. G. Schallhausser, a citizen of the State of Nebraska, having applied therefor, is hereby granted by the Secretary of Commerce, for a period of one year, on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this License to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said station is located: Provided, That no interference other than may result under the restrictions contained in this License shall be caused with the radio communication of stations of the Government of the United States or licensed stations.

2. The use or operation of apparatus for radio communication pursuant to this License shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the transformer input shall not exceed one ~~one-half~~ kilowatt.*

6. The station shall not use a transmitting wave length exceeding 200 meters.

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the act of August 13, 1912.

8. The President of the United States in time of war or public peril or disaster is authorized by law to close the station and cause the removal therefrom of all radio apparatus, or may authorize the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorized by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector, or other duly authorized officer of the Government.

11-1900

*Strike out "one" if the station be within 5 nautical miles of a naval or military station; otherwise strike out "one-half."

Photo A. *1912 provisional license.*

detecting wireless signals. In this same year, the Marconi Wireless Company of America was established.

1900

At the turn of the century, the English co. changed its name to Marconi Wireless Telegraph Company, Ltd., to be more in keeping with current developments.

1901

In 1901, Marconi and two of his engineers came across the Atlantic to set up their wireless equipment in Halifax, Newfoundland. They succeeded in receiving messages across the waters from a station transmitting out of Poldhu, England. All this on very long wavelengths, since the shorter ones were still undiscovered. By this time, many ships at sea were installing transmitting and receiving equipment and many shore and inland locations had established communication centers.

1902

By 1902, a great deal of interest was shown in the application of this relatively new phenomenon. Gradually, better detecting devices were invented and larger stations were erected in Europe, America, and other countries. One should call attention to the contributions made at this time by Sir J.J. Thompson, a British scientist, who had discovered the electron, enclosed in a vacuum tube. It was a sequel to Edison's invention of the light bulb.

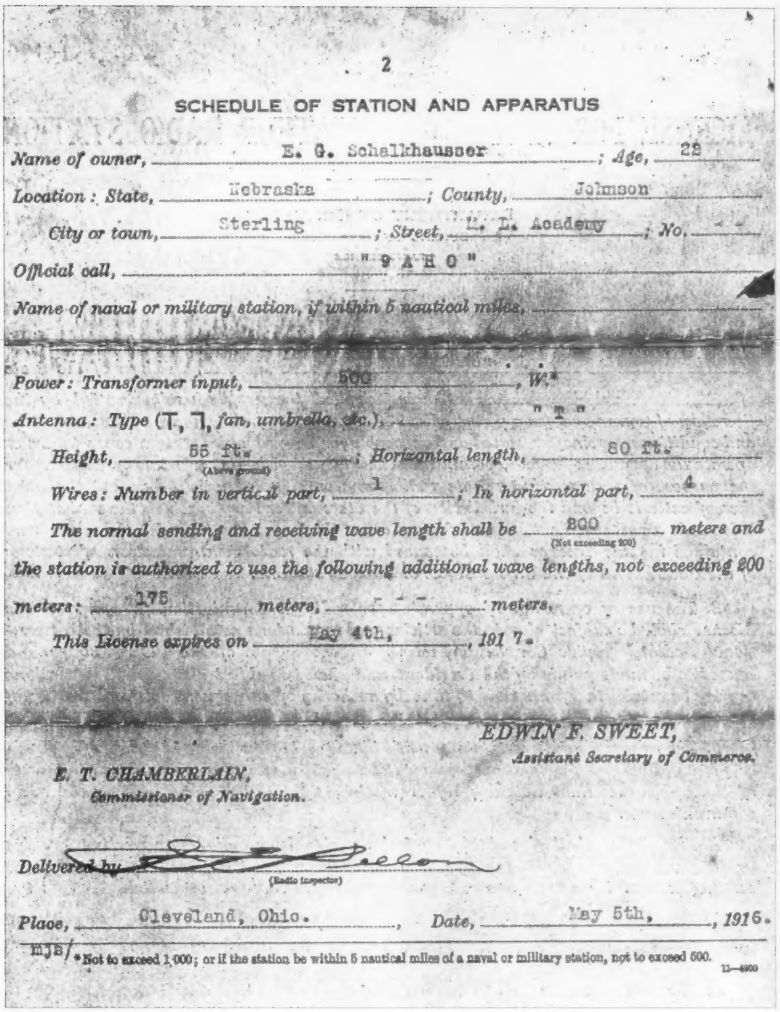
1904 and 1906

This led to the development of the use of vacuum tubes in detecting wireless signals, where J.A. Fleming in 1904 and Lee DeForest in 1906 made their contributions. While the sagas of the sea kept the newspapers busy and the public talking of the great wonders of wireless and its possibilities, what do you suppose was going on among the younger scientists across the country, especially in the eastern part of our United States? All of these intriguing possibilities of radio did not just belong to commercial companies — *by no means!*

Here we digress a bit and look into the back rooms and woodsheds around the country, taking note of the enthusiasm and the influence that wireless had produced among the young. We need to find out what was going on in these areas, since this part of early wireless history is vital in following the progress of the new discovery.

1909

This brings me to the year 1909, previously referred to. While the commercial



2

SCHEDULE OF STATION AND APPARATUS

Name of owner, E. G. Schalkhausser; Age, 22

Location: State, Nebraska; County, Johnson

City or town, Sterling; Street, U. T. Academy; No. - -

Official call, "9 A H O"

Name of naval or military station, if within 5 nautical miles, - - -

Power: Transformer input, 500, W.*

Antenna: Type (T, ⊓, fan, umbrella, etc.), T T T

Height, 55 ft. (Above ground); Horizontal length, 80 ft.

Wires: Number in vertical part, 1; In horizontal part, 4

The normal sending and receiving wave length shall be 200 (Not exceeding 200) meters and the station is authorized to use the following additional wave lengths, not exceeding 200 meters: 175 meters, - - - meters.

This License expires on May 4th, 1917.

EDWIN F. SWEET,
Assistant Secretary of Commerce.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Delivered by [signature] (Radio Inspector)

Place, Cleveland, Ohio. Date, May 5th, 1916.

MJB/ *Not to exceed 1,000; or if the station be within 5 nautical miles of a naval or military station, not to exceed 500. 12—4900

Photo B. Schedule of Station and Apparatus.

interests considered wireless in terms of their restricted domain, we find a group of "wireless kids" in New York, no more than ten in number, all in their teens, getting together and forming a Junior Wireless Club on January 2, 1909.

They were putting together metal plates, wires, and iron filings, making their own coherers, winding coils and other paraphernalia, and succeeding in sending dots and dashes according to the Morse code, between their homes, from block to block, and even across miles. They were listening in to what was going on, hearing the messages floating around between ships and shore stations. This was real fascination!

1910

Naturally there were bound to be conflicts developing, especially between the commercial companies and the "interlopers." Interference occurred and became objectionable for "the big boys." So in the following year, 1910, the existing problems were brought to the halls of Congress, to find ways and means to regulate wireless communication and define domains. True, the ether was free space and belonged to everybody, but the commercials and their interests sought to have vested right in their use of this "free" space. Thus, the conflict …

The conflict was brought to a head in the introduction of two bills, one in the House and one in the Senate. House Bill #23495 and Senate Bill #7243 were introduced. The senator strongly in favor of these bills was none other than Chancy Depew of New York, which was the bailiwick where the interlopers were operating. The contents of the bills were strongly against any use of the airways by anyone except the commercials. The teenagers with their homemade equipment and their determination, organization, and above all, their spirit, had other ideas. They wrote a letter to Chancy and told him so. Here we note something which will be of interest to all of you. The boys of the Junior Wireless Club had a meeting, selected their representatives, and asked to have a hearing in Washington. They composed another letter to Chancy Depew, were granted a hearing, and on April 28, 1910, were given the privilege of presenting their case. Believe it or not, these boys won their right to go on experimenting as they had done before. This Junior Wireless Club had performed like veterans in the halls of

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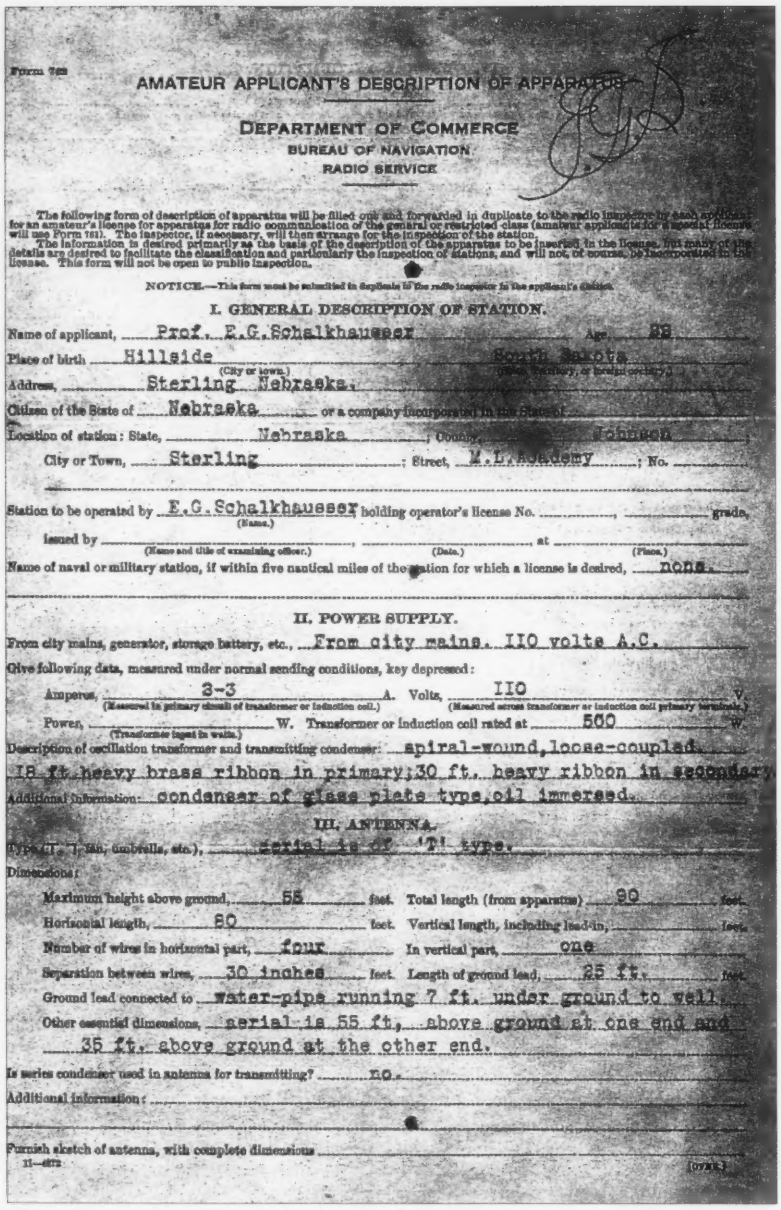

Form 722

AMATEUR APPLICANT'S DESCRIPTION OF APPARATUS

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION
RADIO SERVICE

The following form of description of apparatus will be filled out and forwarded in duplicate to the radio inspector by each applicant for an amateur's license for apparatus for radio communication of the general or restricted class (amateur applicants for a special license will use Form 761). The inspector, if necessary, will then arrange for the inspection of the station.
The information is desired primarily as the basis of the description of the apparatus to be inserted in the license, but many of the details are desired to facilitate the classification and particularly the inspection of stations, and will not, of course, be incorporated in the license. This form will not be open to public inspection.

NOTICE.—This form must be submitted in duplicate to the radio inspector by the applicant's station.

I. GENERAL DESCRIPTION OF STATION.

Name of applicant, Prof. E.G.Schalkhaueser Age 28
Place of birth Hillside South Dakota
(City or town) (State, Territory, or foreign country.)
Address, Sterling Nebraska.
Citizen of the State of Nebraska or a company incorporated in the State of
Location of station: State, Nebraska; County, Johnson
City or Town, Sterling; Street, M.L.Academy; No.
Station to be operated by E.G.Schalkhaueser holding operator's license No. ; grade,
(Name.)
issued by (Name and title of examining officer.) (Date.) at (Place.)
Name of naval or military station, if within five nautical miles of the station for which a license is desired, none.

II. POWER SUPPLY.

From city mains, generator, storage battery, etc., From city mains. 110 volts A.C.
Give following data, measured under normal sending conditions, key depressed:
Amperes, 3-3 (Measured in primary circuit of transformer or induction coil.) A. Volts, 110 (Measured across transformer or induction coil primary terminals.) V.
Power, (Transformer input in watts.) W. Transformer or induction coil rated at 500 W.
Description of oscillation transformer and transmitting condenser: spiral-wound, loose-coupled.
18 ft. heavy brass ribbon in primary; 30 ft. heavy ribbon in secondary.
Additional information: condenser of glass plate type, oil immersed.

III. ANTENNA.

Type (T, 1-kn, umbrella, etc.), aerial is of 'T' type.
Dimensions:
Maximum height above ground, 55 feet. Total length (from apparatus) 90 feet.
Horizontal length, 80 feet. Vertical length, including lead-in, feet.
Number of wires in horizontal part, four In vertical part, one
Separation between wires, 30 inches feet. Length of ground lead, 25 ft. feet.
Ground lead connected to water-pipe running 7 ft. under ground to well.
Other essential dimensions, aerial is 55 ft., above ground at one end and 35 ft. above ground at the other end.
Is series condenser used in antenna for transmitting? no.
Additional information:
Furnish sketch of antenna, with complete dimensions
11—6872 (over)

***Photo C.** Amateur Applicant's Description of Apparatus.*

congress, and to them and many others went the freedom of the ether for many years to come.

1911

So in 1911, the enthusiasm on the part of radio amateurs grew tremendously. In the same year, the Junior Wireless Club changed its name to the Radio Club of America, which it remains to this day. The members became notables in wireless. The club was held in very high esteem, especially after their confrontation with Congress and their display of courage and dedication for a cause dear to their hearts and right in principle.

By 1911, every wireless company and operator on ship and shore knew that regulations were a necessity to hold down interference in radio communication. An act, dated June 24, 1910, authorized by our Department of Commerce, Bureau of Navigation, became what at that time was considered the law of the land regarding radio transmission and reception. This act consisted of four sections, all very general, and was labeled An Act to Require Apparatus and Operators for Radio Communication on Certain Ocean Steamers.

1912

On July 23, 1912 (two years later), and then only pertaining to section one of the four sections, the act was amended, spelling out some specific details concerning operators and ships at sea. From then on, all transmitting stations would have to apply for a license to operate. The law was not too specific. It had loopholes, and many inland stations, especially amateur radio enthusiasts and experimenters, went about hooking up induction coils and going on the air with call letters assigned by themselves. For instance a "one inch" spark coil was considered to be limited to no further than eight or ten miles, and so did not fall within the law for crossing state borders! What a "primitive" concept of wireless in those days. The type of signal coming from these amateur-operated coils did not conform to any known bandwidth or frequency standard. A signal was "just a signal."

At this time, a number of wireless organizations blossomed. Notable among these were (1) The Institute of Radio Engineers, (2) The American Radio Relay League, and (3) The National Amateur Wireless Association. Up to this time there was very little literature or published information available. It did not take long for these to appear. Soon small companies issued store catalogs offering everything from loose couplers to crystals and crystal holders, headphones, and all sorts of gear to get the amateur started. Enthusiasm ran high. Wireless was a newfound discovery and appealed to the young as well as to the old. Wireless could be used to span great distances and for so many experiments. The fascination of distant communication without wires was gripping and overwhelming.

1914

Hiram Percy Maxim was one individual

who could come up with the right ideas at the right time, and the ARRL was his heritage. No sooner had this enthusiasm caught fire when World War I broke out in Europe in 1914.

1917

The conflict went on for several years and, sure enough, the United States became involved in 1917. All radio amateurs received notices to dismantle their equipment. Many joined the services in one capacity or other, many into the Signal Corps, where their training and experience as radio operators was greatly appreciated by the government.

During the hostilities of World War I, in which the United States was involved from April 1917, to November 1918, there were no amateur activities on the air. After the armistice was declared, amateurs still had to wait almost a year before permission was granted to dust off the old equipment, make repairs, catch up on the many changes to be made due to advancements in the art, and become active again.

It is interesting to follow the trend in activities among amateurs during the lull due to the war. *QST*, the publication of the Amateur Radio Relay League, continued to appear every month until September 1917. Then followed increased government restrictions, rather severe. The edict: "No radiation, no ground connections, no capacity or inductance to hook-up!" Amateurs were told, "You may read radio books, think radio thoughts, and learn the Morse code, until the call comes to join up." Many amateurs enlisted in the Signal Corps or the Navy, or found employment with the services.

1918

Although the armistice was signed on November 11, 1918, amateurs waited some months before radio publications were again available. The first postwar edition of *QST* appeared in July 1919, and other periodicals made their appearance, notably *Wireless Age* and *Radio Amateur News*. Restrictions on amateur transmission were removed by the government on October 1, 1919. Here it should be noted that an attempt was made through the introduction of a bill, known as HR 15159, requested by the Secretary of the Navy, to turn over all radio control to the Navy Department. This bill received very strong opposition from the amateur radio fraternity and was defeated.

What were the regulations which now governed the radio amateur? All licenses were canceled as of April 1, 1917. Rules and regulations had to be

IV. GENERAL INFORMATION.

Normal wave length used in sending 200 meters. Other wave lengths, ... meters.

Note.—In many cases two or more waves are simultaneously radiated from the transmitter. Care must be taken that no wave exceeds 200 meters in length.

Normal day communicating range with similar station No power during day. miles.

Designation of stations with which communication is carried on:

No. 2701 O St. Street. Distance, 35840 mi. Owner, H.H. Smith

No. IO Street. Distance, IO Owner, Lyle Francis

No. ..... Street. Distance, ... Owner, ...

No. ..... Street. Distance, ... Owner, ...

Additional information: .....

April 20 1916 (Date submitted by applicant.) Jos. G. Schalkhammer (Signature of applicant.)

INSTRUCTIONS TO RADIO INSPECTORS.

Please send out this form in triplicate, one for the applicant's files, if he desires.

When filled in and returned, fill out the following:

Received by .....

at ..... Date, ...

Date of inspection (if inspected) .....

Licensed as { general / restricted } amateur station.

Serial No. .....

Date of issue, ...

Signature of Inspector, ...

The inspector will then retain a copy for his file, and forward the form to the Commissioner of Navigation, to whom the inspector should also submit a special report before issuing the license if he be in doubt on any matter concerning it.

11—4678

Photo D. *An apparatus description, one of the required parts of getting an early ham ticket.*

Photo E. *The station of 9AHO.*

JUNIOR WIRELESS CLUB, LTD.

EACH MEMBER MUST HAVE MADE HIS OWN STATION.

W. E. D. Stokes, Jr., Its President—Headquarters at the Ansonia Contains Much Apparatus—Club to Go to Washington to Oppose Pending Bill.

It is somewhat dangerous to attempt to enter the clubroom and experimental station of the Junior Wireless Club, Ltd., without a guide, for the officer in charge dispenses with the necessity of lock and key by having the knob charged with electricity to give the unexpected—and unexpecting—visitor what he terms a "nice little shock."

But when proper guidance is secured from the club's young president, who maintains headquarters at his home, the Ansonia, many marvels and intricacies may be observed with some degree of security. W. E. D. Stokes, Jr., president, aged 11 years, points out the pitfalls.

"Look out. Don't step on that wire there!" says he. "It's charged!" And you look out and don't step.

The clubroom and receiving station is imposing, almost formidable despite its somewhat small extent. In addition to the wireless telephone instruments at one side of the windows, the sending station across the way and the aerials connecting with three conduits above many other things more or less electric add to the effect. A big electric turning lathe occupies one side of the room, numerous vari-colored models of aeroplanes—which the manufacturer asserts really go when wound up—hang from wire complexities overhead, zinc plates, worse than they look, are not to be ignored.

In fact it is not safe to put a hand to the most innocent looking object unless first reassured. A big box beneath the battery and motor table filled with perfectly staid appearing earth and plants which thrive on the rays of a makeshift sun specially arranged out of a 100 candle power electric bulb is not what it would seem. Those plants—roots, branch, leaf or blossom—are electrified and emit sparks when invited. On the side walls high and low, on the ceiling and suspended therefrom, bulbs of every conceivable variety, shape and power transform the little room into an Aladdin cave of brilliancy.

"I'm always looking around at home," says the president, "and when I see a new kind I try it."

So there they are, long and slim, short, fat and round, but all shining and bringing out dazzlingly the blueprints of scientific aspect which adorn one side of the wall, posters of the Postal Telegraph and Cable Company variety, illuminated letter placards bearing such legends as "No Smoking," "S. W. Co."—Stokes Wireless Company—and last but not least printed lists of wireless signal stations and steamers with wireless equipment.

These steamers and signal stations are all intimately acquainted with the experimental station of the Junior Club too much so at times, it seems, when the Manhattan Beach station has to ask it to stop receiving for a time, for the Manhattan Beach station is less powerful and is retarded in receiving.

The young president puts the receiving headgear on your head.

"Listen," he says. "They're talking to Manhattan Beach."

"How can you read it?" you ask.

"Listen," he says. "Those are da-da-da-da—don't you hear it?" And he becomes a trifle impatient at your stupidity. He discusses condensers detectors, sensitive points and other appropriate topics for your enlightenment, but you are a poor subject.

Then the president tells how the Junior Wireless Club came to be, how it operates and what it intends.

About two years ago the Junior Aero Club, under the direction of Miss L. L. Todd participated in the toy exhibition held at Madison Square Garden. Three of these youthful members, Frank King, Faitoute Munn and Frederick Seymour, specialized on wireless telegraphy and frequented Miss Todd's studio on West Twenty-third street to experiment. Each of them made his own wireless apparatus and through the newspapers they invited any other boy to come and show a mechanical set he had made himself.

W. E. D. Stokes, Jr., then aged 11, had rigged up a wireless outfit which he brought forth to display and which, knowledge helped him set up. Such terms as the "A. B. C. of Wireless Telegraphy" and "Electricity of Everyday Life" and possibly, the random assistance of a random electrician were the principal sources of information.

The father of W. E. D. Jr. met the boys and invited them to be hosts to a club. There the Junior Wireless Club, Ltd., came into being with headquarters at the Ansonia, there being just enough room to go around among the charter members. W. E. D. Stokes, Jr., was made president; George Hitz, 431 West Forty-seventh street, vice-president; Faitoute Munn, East Orange, N. J., recording secretary; Frank King, 780 West 169th street, corresponding secretary; Frederick Seymour, East Orange, N. J., treasurer; Miss L. L. Todd was made honorary president; Prof. E. A. Fessenden of Brant Rock, Mass., was chosen consulting engineer, and Seymour, Seymour & Mudrath, 31 Broadway, as general solicitors and patent attorneys. Even from the start the club's letterheads presented a complete and dignified appearance and are as yet unchanged, although the club has extended its membership to thirteen.

At 10 A. M. the first Saturday of each month from October to May the club holds meetings at the Ansonia, goes through the regular preliminary business acts on the business letters received and the applications for membership, talks over schemes and, most of all, works with the wireless. The necessary qualification for membership is that the applicant has himself made his own wireless apparatus, later he may have assistance and more elaborate mechanical contrivances, but the first rule is inviolable.

They first memorize the Morse code until they are able to think in dots and

W. E. D. STOKES, JR., AND HIS WIRELESS TELEGRAPH.

Photo F. *This article appeared in a New York City newspaper early in 1910. The boy in the picture is the first president of the Junior Wireless Club, later renamed the Radio Club of America.*

followed to go back on the air. Amateurs knew that the Department of Commerce still had complete jurisdiction with William Redfield, Secretary of Commerce, at the time. A publication issued by the Bureau of Navigation, Radio Service, dated August 1919, entitled "Radio Communication Law of the United States," indicated that no additional radio regulations had been added to those in effect as of the beginning of hostilities. In fact, no changes were made in the radio law during the interim between the introduction of the Act of June 24, 1910, and the ratification of the International Convention of Communications, finalized and signed by Woodrow Wilson, then president of the United States, on July 8, 1913.

1919

Applications for amateur radio operators and station licenses soon had the fraternity by the hundreds back into the swing. The spark coil, the rotary gap, and the old receivers had to be brought up from the basement or down from the attic, unpacked from storage bins, and put back into service. As soon as restrictions were removed, activity started with a vengeance. Radio shops blossomed everywhere. The old wireless bug put everybody to building loose couplers, variometers, honeycomb coils, simple detectors, and a host of new devices. Along came the newly developed three-element vacuum tube. Here was the beginning of the real revolution in reception and transmission of wireless signals. The VT-1 by Western Electric gave the amateurs their first chance to analyze its possibilities. There also were Morehead and Marconi tubes available, but they were very unstable as receiving as well as transmitting units. No two alike would respond equally in a circuit. We were all looking for the advent of larger and more powerful vacuum tubes, and anxious to replace the old spark transmitter. The amateurs knew that it was possible to do away with the noisy spark discharges with their interference problems due to wide bandwidths, and put a new kind of signal into the ether using vacuum tubes.

At ARRL headquarters in Hartford, Connecticut, where *QST* originated and where our newly appointed secretary and editor, K.B. Warner, took over right after the war, it was decided that the entire body of amateurs be organized into local and regional clubs and associations. The objectives were to foster and promote complete control of all ham activities such as relaying messages, to establish relay routes across the country, and to keep abreast of all governmental legislation pertaining to amateur radio activities.

K.B. Warner, the ARRL's new secretary, came from Cairo, Illinois. A very active amateur, he operated under the call 9JT in 1915, using a 1/2 kW fixed-gap transmitter.

All amateur radio stations were supposed to be operating on the 200 meter assigned wavelength. Adherence was not too strictly enforced. In fact, some stations were operating well above 200 meters. A few, with special permission, were well into the 375 meter range. So little was known about radio propagation that the erroneous assumption persisted that "the longer the wavelength, the greater the distance waves would travel." The August 1920, *QST* said, "For short wavelengths (below 200 meters) the signal strength is a function of the wavelength, and it may be said that the shorter the wavelength, the weaker the signal." *How strangely the ether waves behaved in those days!*

Everybody was still using interrupted CW, some straight, some quenched, with the only noticeable difference being in the pitch, the whine, and the characteristic interruption of the dots and dashes. Some found satisfaction in a 500 cycle note, if a 500 cycle generator could be found as the prime source of power. Interference created bedlam in many areas, especially before midnight, after which most of the spark coil operators quieted down and went to bed, giving the high-powered boys the ether. The maximum power transformer rating was one kW, usually a Thordarson or Clapp-Estham or equivalent rated at 25,000 volts secondary. The law was specific: "A transmitting wavelength not exceeding 200 meters and a transformer input not exceeding one kilowatt." The ammeter hot wire in the antenna usually was asked to register from 4 to 10 amperes into an L- or T-type antenna configuration. It had to be designed and built to a measured length, specifically not over 100 meters, to be within the law. There were plenty of parallel wires, usually at least four, to form a ground network of copper conductors (or buried copper washboilers) for a counterpoise.

The amateurs had a standby pal, "The Old Man," delivering pertinent information to all through articles in *QST*. He kept all in good humor and within the straightjacket of operating procedures. As an example of what could be expected from the OM, here

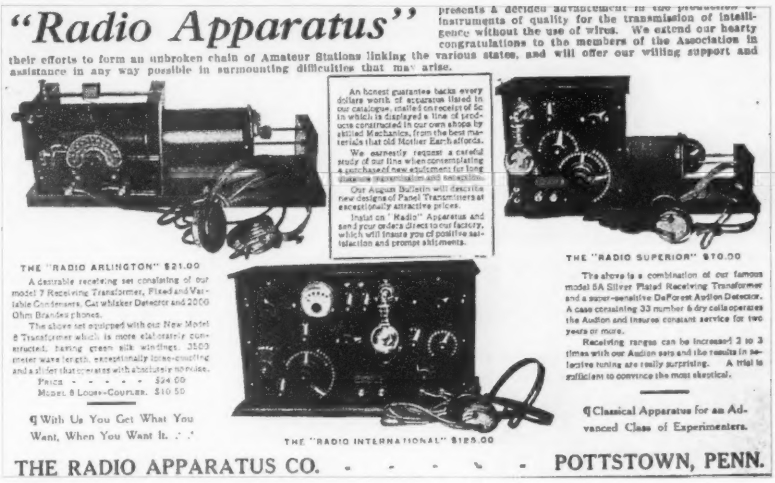
"Radio Apparatus"
their efforts to form an unbroken chain of Amateur Stations linking the various states, and will offer our willing support and assistance in any way possible in surmounting difficulties that may arise.
An honest guarantee backs every dollars worth of apparatus listed in our catalogue, stalled on receipt of Sc in which is displayed a line of products constructed in our own shops by skilled Mechanics, from the best materials that old Mother Earth affords.
We earnestly request a careful study of our line when contemplating purchase of new equipment for long distance transmission and reception.
Our August Bulletin will describe new designs of Panel Transmitters at exceptionally attractive prices.
Insist on "Radio" Apparatus and send your orders direct to our factory, which will insure you of positive satisfaction and prompt shipments.
THE "RADIO ARLINGTON" $21.00
A desirable receiving set consisting of our model 7 Receiving Transformer, Fixed and Variable Condensers, Cat whisker Detector and 2000 Ohm Brandes phones.
The above set equipped with our New Model 8 Transformer which is more elaborately constructed, having green silk windings, 3500 meter wave length, exceptionally tone-quality and sharper that operates with absolutely no noise.
Price - - - - - $24.00
Model 8 Loose-Coupler, $10.50
¶ With Us You Get What You Want, When You Want It.
THE "RADIO INTERNATIONAL" $185.00
THE "RADIO SUPERIOR" $70.00
The above is a combination of our famous model 8A Silver Plated Receiving Transformer and a super-sensitive DeForest Audion Detector. A case containing 33 number 6 dry cells operates the Audion and insures constant service for two years or more.
Receiving ranges can be increased 2 to 3 times with our Audion sets and the results in selective tuning are really surprising. A trial is sufficient to convince the most skeptical.
¶ Classical Apparatus for an Advanced Class of Experimenters.
THE RADIO APPARATUS CO. - - - - - POTTSTOWN, PENN.

Photo G. *As soon as radio became popular as a hobby, equipment began appearing on the market. Note the flamboyant style of the copy, typical of the period. This ad appeared in 1915.*

is an excerpt directed to the editor from the June 1919, *QST* under the heading "Rotten Starting":

"I am sending you a specimen of a *Wouff Hong* which came to light out here when we started to get our junk out of cold storage. Keep it in the editorial sanctum where you can lay hands on it quickly in emergency. We will be allowed to transmit soon and then you will need it."

Who does not know the *Wouff Hong?*

What most of the amateurs surmised and expected was just ahead. We read in November, 1919:

"There will come a day when amateurs will not need to bother their heads about government or commercial stations, but THAT DAY HAS AS YET NOT ARRIVED. The radio millennium has still to come. We mean by this that with our present form of crude apparatus still in vogue, and when we are using quasi makeshifts, we cannot

National Amateur Wireless Association
This is to certify that
Prof. E. J. Schalkhaussen
having furnished satisfactory credentials and having shown that he is a student of Radio Communication is hereby accepted in fellowship and full membership in THE NATIONAL AMATEUR WIRELESS ASSOCIATION of America. He agrees hereby as shown by his signature, to promote the interests of experimental radio work and at all times to observe the Laws of Radio Communication of the United States.
Signed by
Member
Approved
Executed by
Membership expires Jan 1917.

Photo H. *Issued in January 1917, this certificate was one of the first of the "awards" that hams have always displayed with pride on the walls of the shack.*

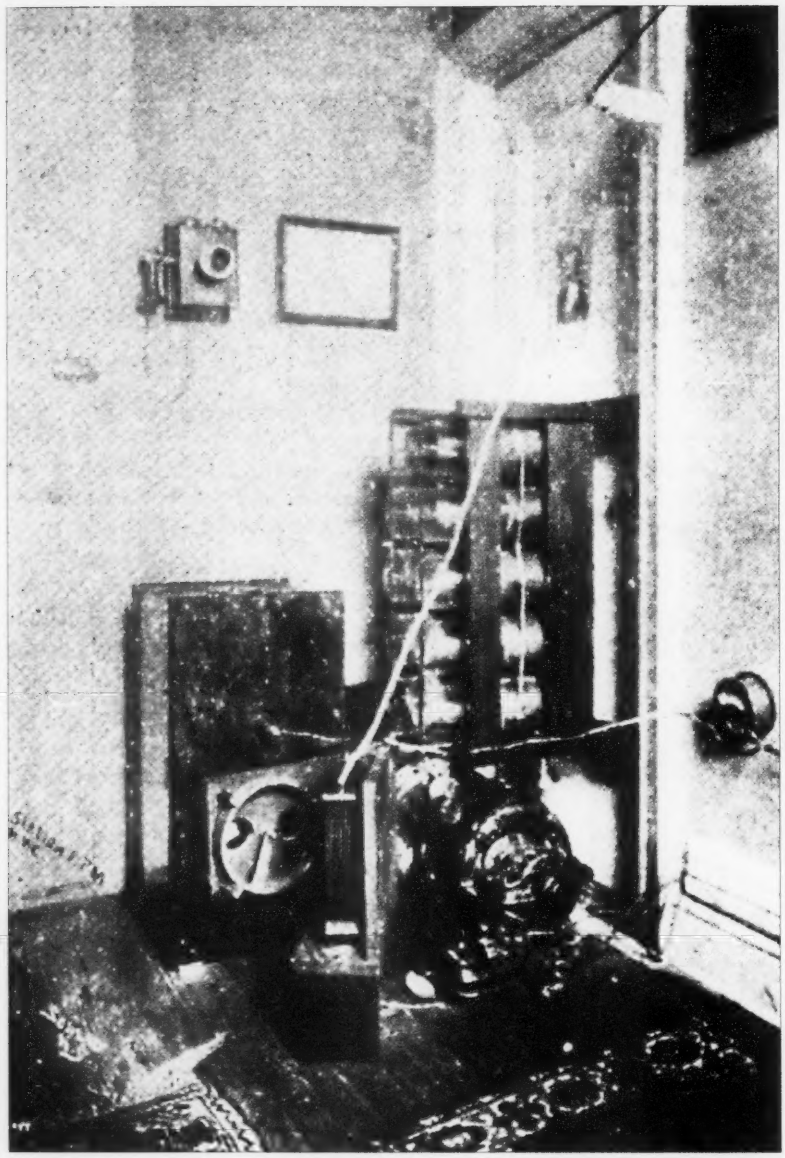

Photo I. *The transmitter station "2PM", which produced the first transcontinental signals.*

expect that we can tune our transmitters down to within the hundredth fraction of a meter. Usually the amateur wave is so broad that it can be picked up all over the scale. As long as we persist in sending out such waves, we must expect criticism from the big stations with which we interfere."

The junking of the radio spark gap was in the making. To actually let go was another thing. Some of the old-timers in 1920 complained that there was no romance in tube transmission—that it has no individuality or traditional associations like the old spark. There was always a certain stalwart and hearty attraction about the old non-sink rotary, noisy and inefficient as it was. So the *Old Guard* had to finally succumb also to *the little bulbs that had nothing in 'em.*

This is what Dr. Lee DeForest, the man responsible for the development of the three element tube, had to say at this time (November, 1919):

"The average radio amateur knows enough of the extreme selectivity which the pure undamped wave makes possible, to realize that the problems of interference would largely vanish with the spark gap. Let the amateur urge upon his Congressman or Senator that if the government wishes to further legislate against radio interference, then legislate out of business the damped-wave transmitter."

1920

So it became necessary that the amateurs gradually develop the use of the vacuum tube for the various modes of CW transmission, modulating via key and voice, and for better receiving possibilities. With better sensitivity and selectivity built into receivers, our efforts were now directed toward solving the QSS *Bugaboo!* What is QSS? The Q code gives no definition. So — take a look into the May 1920 issue of *QST,* page 25. Well, since you do not have a copy, this "new" abbreviation was added to the list, adopted by ARRL to fill a need. What does it stand for?

QSS?—Do my signals fade?

QSS—Your signals fade.

Although rarely used, this abbreviation, even in these days, makes sense.

Amateur radio was not out of the woods regarding clear sailing without periodic attempts on the part of the government to curb their activities. The Poindexter Bill, originating as document #165 through a letter from the Secretary of the Navy, was in the hopper. It stood facing the amateurs later on as Poindexter Bill S-4038, and did not bode good news for the amateur. The time loomed on the radio horizon in 1920 to be thinking about international regulatory legislation to bring radio communication the world over under better control. A meeting of the International Communications Convention in Berne, Switzerland, was on the agenda. The radio amateurs had to have prominent representation. Intensive efforts were made to protect the rights and privileges belonging to the amateur. Charles H. Steward, member of the ARRL Board, was appointed legal counselor to speak for the amateur in these matters. In order to cement more firmly the ties that bind, amateurs decided that in numbers and in get-togethers there is strength, and much could be accomplished via this

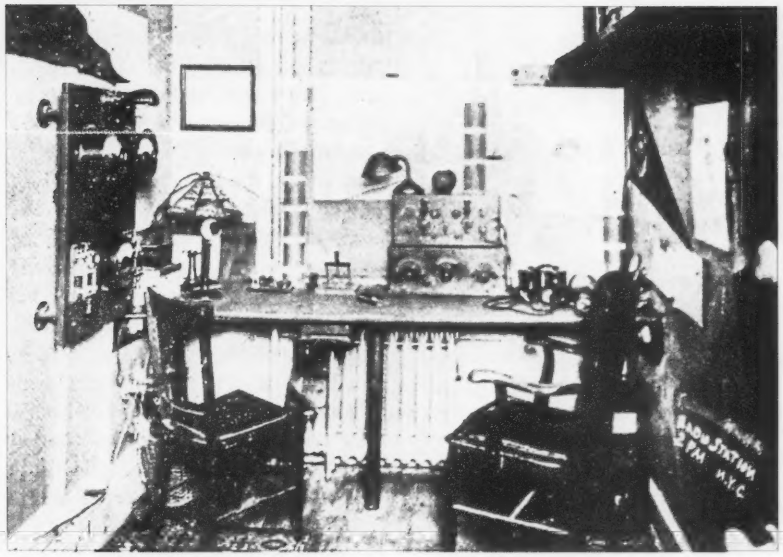

Photo J. *"2PM" operating position located at 808 West End Avenue in New York City.*

route. The thinking centered on having regional conventions, typical gatherings to meet each other personally, to set out program meetings, and to air mutual problems.

One of the early conventions took place in Chicago, sponsored by the Central Division Managers of ARRL. Held September 2 to 4 at the Edgewater Beach Hotel, there were about four hundred in attendance. There had been similar conventions held in Boston and Philadelphia, but this one in Chicago was to be of wider scope in quantity and quality to bring home to all amateurs what we were up against. The report issued from headquarters: "The convention out-conventioned anything yet pulled off in amateur radio."

Not to be outdone, and to top off the year 1920, the Midwest ARRL Division decided that St. Louis would be the next place for a meeting. The time? December 28 to 30, under the sponsorship of the St. Louis Radio Club. Everybody of note in amateur radio circles showed up, from ARRL president Hiram P. Maxim, *QST* editor K. B. Warner, the Chicago gang, Paul Godley, M.B. West, R.H.G. Mathews, and of course, "The Old Man" himself, who gave a stirring account of the "joyous" and "glorious" three days.

To be continued.

HT Porta-Power Project

continued from page 15

1/4-inch and interior dimensions of 10-1/2 inches in length by 5 inches wide, which works well for this application. The box was bought at Staples, a retail chain office supply store. The only modification made to the box was cutting its wall height down so as to permit the cigarette lighter receptacle on the Power Station to be accessed. Someone with a table saw can easily do this. If you do not know of anyone who has a table saw, a cabinet shop or wood hobbyist in your local area should do it for a modest fee.

Getting it all together

Now comes the task of putting the whole package together. Place the Power Station toward the left side of the box. This allows the AC wall charger input jack to be easily accessed without rearranging the setup. In order to keep the Power Station from sliding around inside the box, position a piece of Styrofoam approximately 1/2 to 3/4 inches thick beside the Power Station. A piece about 3 x 5 inches will work to hold the Power Station in place by creating a stop that fills in the remaining space along the bottom of the box. This remaining space beside the Power Station can be used to store the HT battery, power cable, or other various accessories.

At this point, clip the HT somewhere along the front of the box. Locating it on the left side of the box permits clear

Photo K. *"Mule Mobile" was used by the Signal Corps during World*

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TRANSFORMERS
14,000 VOLTS
Designed for use of 110 volts, 60 cycles. No impedance is required. All of our Products are Fully Guaranteed
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CAPACITY MOUNTED UNMOUNTED
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¾ K.W. 20.50 18.50
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Winger's Rotary Spark Gap
Complete as above, $11.50
Rotary Parts:—
Hub bored to suit ¾" to ¾" $ .45
Bak-e-lite dielectric centers .75
Aluminum (or Zinc) segments 1.00
Wood base .50
Stationary electrodes, per pair 1.25
Disc, complete 2.75
Motor only, (variable speed) 5.00
Motor and Disc together 7.50
TOTAL WEIGHT OF DISCS from 3 to 4 oz. only
Winger Electric & Mfg. Co.
711 S. Dearborn St. Chicago, Ill.

Photo L. *An early QSL card, sent in 1917.*

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- AC Wall Charger
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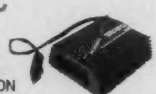

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Model	Cont. Pwr	Peak Pwr	Price
PC140	140 Watts	250 Watts	$34.95*
PC300	300 Watts	500 Watts	$49.95*
PP500	500 Watts	800 Watts	$99.95*
PP1000	1000 Watts	2000 Watts	$219.95**
PP1500	1500 Watts	3000 Watts	$324.95**
PP2500	2500 Watts	4000 Watts	$549.95***

*$10.50s&h **$12.50s&h ***$14.50s&h

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- Flexcharge 12V x 7 Amp Controller.....$59.95+$8.50s&h
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- Charge Controllers for Multiple Battery Banks Also!

POWER STATION

- 12 Volt x 7 Amp/Hr Gel Cell Battery
- 12 Volt Cigarette Lighter Outlet
- 3, 6, & 9 Volt Output Jack
- Car & Wall Charger w/Auto Shutoff, Built-in Voltmeter
- 2 Hidden Terminals For Hardwiring Provide Up To 90 Amps (Short Circuit)

MEGA STATION

- 17 Amp/Hr Gel Cell w/Heavy Duty Jumper Cables Provide up to 300 Amps Short Circuit
- Cigarette Lighter Output
- Charge Indicator Meter
- Car & Wall Charger w/Auto Shutoff

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- 5 Watt: $105* 11 Watt: $179** 22 Watt: $219**
- 32 Watt: $269*** 42 Watt: $329*** 64Watt: 449****
- Flexible 5, 11 & 32 Watt Panels
- 5 Watt Flex: $115* 11 Watt Flex: $189** 32 Watt Flex: $399***
- Reverse Blocking & By-Pass Diodes
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- Triple Junction Silicon Cells
- *$10.50s&h **$12.50s&h ***$16.50s&h ****$18.00s&h

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FAX 714-901-0583
ORDERS 800-933-4264
E-MAIL: 73@HAMCONTACT.COM
VISIT OUR BRAND NEW WEBSITE:
WWW.HAMCONTACT.COM

For Literature on Antennas, HT & Gel Batteries, Inverters Power Supplies, Etc., Send a large SASE w/3 stamps

access to the Power Station on-off switch and the 12 VDC output cigarette lighter receptacle. It also keeps the area of the battery voltmeter unobstructed. Run the HT's external power cord behind the HT and into the box. There should be enough space between the Power Station and the front wall of the box to put most of the cord. Then make connection to the 12 VDC output via the front panel cigarette lighter receptacle or the (+) and (-) terminals on the rear of the power unit. You could opt to use the 3, 6, or 9 VDC output jack if the desired operating voltage is to be less than 12 VDC.

Now the entire package must be bound together for easy transport. This is accomplished by using 1-inch-wide, 48-inches-long, non-stretch nylon belting material and plastic belt clips. The belt clips can be the type that do not require being sewn to the belting material. These items can be purchased at a fabric store such as Minnesota Fabrics. The belting is placed around the entire unit, going over the top of the Power Station handle, down the side, under the box, and up the other side. The fastening of the buckle clips can be located just off the right side of the power unit's handle. You may want to adjust the belt clips to whatever arrangement suits you. This method of holding the package all together works very well. The Power Station's handle actually is used as the handle for the whole package. The power unit has by far the majority of the weight, so it is best to employ its handle to do most of the work. The belting merely holds the box to the unit, which contributes a minimal amount of weight to the overall package.

If you use an external speaker microphone, it can be clipped to the front wall of the box or to an open spot on the belting material. For a finishing touch, consider adding self-adhesive rubber foot pads to the bottom corners of the box. They may be obtained at Radio Shack or a hobby store in your area.

The package makes a neat, highly portable, efficient, easy to configure, and long-lasting power source for extended operation. Also, it is very practical and inexpensive to put together! 73

QRP

Number 41 on your Feedback card

Low Power Operation

Michael Bryce WB8VGE
SunLight Energy Systems
955 Manchester Ave. SW
North Lawrence OH 44666
[prosolar@sssnet.com]

No one can predict the future. I know if I could, I would have never married my first wife! Because if I could foresee the future, I would have never sold my Heathkit HW-8 QRP transceiver. But I did, and ever since then I've been kicking myself in the butt for doing so. The Heathkit HW-8 has become a classic. You're not a QRP operator unless you've worked the world with an HW-8.

Now, having said all of that, I've been looking for an HW-8 on the used market for several years. The ones that I did find were either beat to hell and back or the owners wanted way too much money. At the Dayton Hamvention, I've seen HW-8s going for more than they were when they were new. Then I've found some that have been modified so much that they barely resemble the original HW-8. I have nothing bad to say about improving a rig's performance, but some of the guys added so many switches and buttons that they made their HW-8 a collection of unstable circuits.

The quest begins

All I really wanted was an unmodified HW-8. I could handle some of the simpler modifications such as a dial light and audio amplifier additions. I did not want multiband operation on the WARC bands. I wanted a clean, almost new, unit.

Of course, price was a matter of importance, too. Like everyone else in the world, I wanted the best bang for my buck. I set my budget at $150, provided that price included the operating and assembly manual. I did not need the matching power supply, but if one was available, why not?

Since time seems to be a short commodity in everyone's life, going to hamfests to get an HW-8 did not seem to be a good idea. However, at the hamfests that I did go to, I got a good idea of the going price vs. conditions of an HW-8. Even saw a few HW-7s along the way, too.

So instead of in-person shopping, I did a lot of looking on the Internet for a used HW-8. Some of the locations I visited were: [http://www.webcom.com/webpub/class.html]; [http://www.qth.com/classifieds.shtml]; and, of course, [www.ebay.com].

One of the worst things about buying anything used via the Internet is the lack of playing touchy-feely with the item. You've got to put your trust in the guy who's doing the selling. Most people rate the cosmetic condition of the equipment on a scale of one to ten, with ten being brand new. Now, what I consider a 9.5 may be a lot different from what you consider a 9.5. I've found that most guys selling via the auctions and ad listings are generally honest. If the radio has a defect or a missing knob, they will tell you so.

Now, having said all of that, I found my HW-8 at a hamfest! It was in very good shape and came with an original manual. It even had the entire foldout assembly instructions and schematic. After the usual haggling, the final price was $75.

How to pick a winner from the lemons

If you are buying from the Internet, then you're relying on the seller to report any bugs or cosmetic problems. It's also up to him to let you in on any electrical problem the rig may have, too.

At a hamfest, you have the ability to flip the switches and turn the knobs. Here's what to look for in a used HW-8: The first thing you want to do is run the tuning knob all the way into the stops. Don't force the knob past the stops. The idea is to see if the dial stops at the stops. If you can easily turn pass the stops, then the VFO capacitor may have its rotor plates torn up. Try this test on both ends of the VFO.

If you find the VFO is kaput, then either pass on this one or offer a very, very, very low price. If the VFO capacitor is kaput, then you've got one dead HW-8 on your hands. I know of no source for this VFO capacitor.

The audio selectivity knob is normally only two positions. If you have more than one, then someone at sometime modified the audio filter. If the selectivity knob rotates like a pot, that's not original either.

Check the front push-button switches used to change bands. They all should work. Test them by pushing each one in one at a time. For every one that you push in, the last one should pop out, just like the old-time car radios did. If you find one that does not stay in, the plastic pin is broken off inside the switch. Again, I don't know of a source for a replacement part.

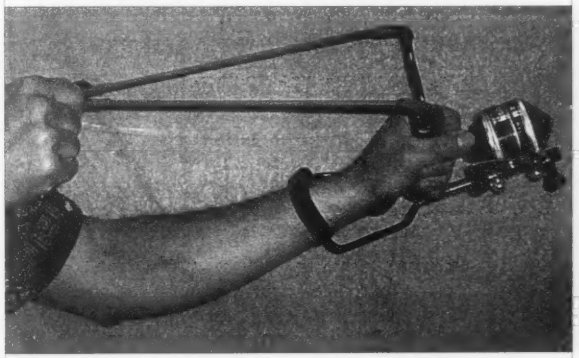
Test the meter by quickly tilting the rig from one side to another. While this won't tell you if the meter has an open or shorted coil, it will let you know the needle is in its bearings.

Flip the rig over and check out the rear apron. The original antenna connector was an RCA-type jack. What do you see?

Continued on page 42

E Z HANG

Hang your next wire antenna the *EZ* way.



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EZ Hang, Inc.
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Laurel MD 20723
Phone: 540-286-0176
Web: http://www.ezhang.com

QRP

continued from page 41

Anything else is a modification to the circuit.

Do you see any switches, knobs, or jacks on the rear? Well if you do, then the HW-8 has been internally modified. How about the power plug? In the original configuration, there is a six-prong Molex connector.

Make a quick mental note about the screws holding the top cover on. Are they black Phillips-head screws or shiny slotted screws? Only the black Phillips-head screws are original. While I would not be upset knowing the original ones are not holding the cover on, it's nice to know this stuff if you're looking for a mint HW-8.

Take a look inside

If you can, pop the top and look inside the rig. I always carry a small screwdriver with me for just such tasks when trolling a hamfest . Be sure you ask permission from the owner before you start taking screws out. And be damn sure you take your time to put back the screws should you decide not to purchase the rig.

Inside, near the antenna connection, you should see a small relay. This is the antenna-switching relay. If you don't see it, the circuit has been changed. Next, look at the front corner on the opposite side of the push-buttons. Located here are the front-end trimmers used for the receiver. The adjustment screws should not be unscrewed to the point that they look like they will fall out! Also, check the position of the slug inside the metal VFO can located in the middle of the PC board. It too should be sitting about in the middle of its form.

If you follow these guidelines, you should be able to pick out an HW-8 in good shape. You have to keep in mind the HW-8 is going on 24+ years; it's going to be harder and harder to find one in mint condition. Also, that green Heathkit paint is very prone to scratches, so don't pass up on a good HW-8 because of a few case scratches on the top cover.

Some initial checks

Use a current-limiting power supply to fire up the HW-8. Batteries provide too much uncontrolled current for first time testing.

You'll also need a pair of high impedance headphones with a 1/4-inch plug. A second 1/4-inch plug for the key jack is required, too. A 50-ohm dummy load is required, as is a QRP RF wattmeter. You can use an SWR meter set to read forward power, too. If you don't have a wattmeter or SWR meter made for QRP use, you'll never see much deflection on the 100-watt-scale wattmeter in your shack.

Initial setup

Pay close attention to the power requirements for the HW-8. It requires 12–14 volts at 1 amp. The HW-8 will operate with a supply voltage as low as 10.5 volts. Watch your polarity! The HW-8 will go poof in a heartbeat if you connect it up backwards to the power source.

With a pair of high impedance headphones plugged into the HW-8, set the band switch to the 7 MHz position. Be sure the button is fully engaged. Turn the RF gain control fully clockwise (max gain) and snap on the power, leaving the volume in mid-range. You should hear a hissing noise from the rig. Run the VFO through its range. You should not hear any whistles or birdies.

If you can, monitor the supply current going to the rig. Be sure you have the 50-ohm load and RF meter connected to the HW-8 antenna output jack. Key down the transmitter. You should hear the antenna relay click, and a sidetone in the headphones. Now, the meter should show some deflection. Adjust the "load" control for maximum meter deflection. You should also see about two watts on your RF wattmeter and no more than 850 mA from the power supply.

The HW-8 will produce up to 2.5 watts of RF on 80 meters and as low as .9 watt on 15 meters. As the frequency increases, the less transmit power you'll see.

So far so good? If the HW-8 passes these checks, it's time to put an antenna on it. Since the HW-8 is a direct-conversion rig, I find it best to go to the high end of the band and work your way down. Tune in to the signal on the high side of zero beat. You tune in to a station calling CQ or into a QSO in progress. That way, when the HW-8 shifts its frequency during keydown, you're on the right sideband and the other station can hear you.

The Heathkit HW-8 is a classic QRP rig. They're great fun to use. It's by far the most popular QRP rig ever made. If you have the chance, pick one up.

Next time we meet, I'll have some troubleshooting tips for putting the HW-8 back into service. 73

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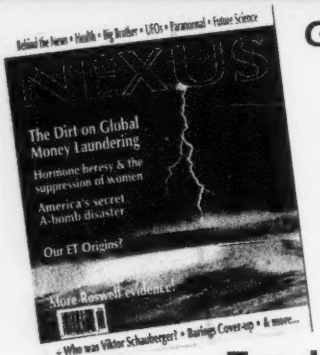
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PSK31 gets even better

The PSK31 really works, and has attracted a lot of attention. Most everyone I talk to is amazed at how good the copy can be from signals that often do not lift the needle on the S-meter. A truly low power winner. Occasionally, you will see copy on the screen and not hear the audio that is producing it!

I am watching my latest experiment as I write this column; the laptop is rigged for PSK31. I don't know how many laptops have a soundcard that is compatible with the PSK31 programs but, at least earlier in the day, this was going like gangbusters.

It's evening, and the August weather is taking a toll on the local atmosphere. I am hearing signals that sound like they are coming over the pole. They aren't. They are mostly stateside and Central America. It will most likely only act this way until I am through writing about my favorite of the month.

My main new toy is a program, a freebie, that I downloaded for the PSK31 that nearly everyone else is using. It can be found at the same Web site as the original program furnished by G3PLX, which is also a freebie.

To my first notion, there seemed no difference between the two programs in the ability to communicate. I was soon to learn that the new (to me) Logger program certainly has more bells and whistles, and they are useful for the PSK31 mode and all the other chores you call on the program to perform. It is written for what the name implies. That is, to help keep track of logging contacts.

Additionally, and I haven't yet been able to identify all the features, it cooperates with interfaces to your radio, is compatible with CD *Callbook*-style programs, will interface with your TNC, and will do just about everything but walk the dog. There are 27 definable buttons (it's a Windows program), so you have room to define messages for just about every imaginable type of action, rag chew to contest, and, of course, the brag file.

If you will refer to the screen shot (**Photo A**) you will notice a spectrum analyzer next to the round tuning indicator with the waterfall beneath it in the upper left quadrant of the image. It is small enough in the picture that it is difficult to see what may be happening at the time of the screen shot.

Giant leap

Interestingly, that spectrum analyzer must be no more than 300 hertz wide. When you are tracking a 30 hertz wide signal, it is about an eighth of an inch wide in the center of the analyzer. I found this to be a giant leap ahead in tuning in a signal. Once you carefully bring the signal into the exact position on the scale, there are two vertical lines that turn from red to yellow. The same thing happens to the indicator inside the round tuning indicator.

For years, I have been pretty sure that my "tuner-perfect ear" has told me modern transceivers don't drift enough to make a problem with steady copy during the average transmission. This spectrum analyzer in Logger dispels that theory.

The Logger program contains, just as does the G3PLX program, an automatic frequency control (AFC) that "tunes" the signal while it is in the soundcard as various forces cause a drift. I turned on the AFC and watched as two stations were chatting, and found the signals to drift, according to the indicator, as much as 21 hertz!

All the time, the copy was nearly letter perfect. I noticed that when I did not turn the AFC on, I was continuously tweaking the tuning knob on the transceiver. If this were CW or SSB it wouldn't have made much difference, but since we are working with such a narrow signal, it is no wonder the copy goes away with a little drift. Twenty hertz is over half the width of the signal!

To make things even better, since the station at the other end has to copy you when you begin to transmit, the system automatically adjusts the transmitting frequency according to the drift it detected. Talk about appealing to the lazy guy. This PSK31 just about does it.

You will find the Logger program at the same URL listed in the chart as for the other PSK31 program. You will have to hunt for it. The Web site has frames in it and you will find a listing for "software availabie," as best I can recall. The problem with frames is that the address of the site you link to when you leave the original page is not listed up at the top of my copy of Netscape.

I don't know if there is a way to fix that, but it makes it difficult to record URLs and pass them on. So I am giving you the starting URL. There is a lot of useful info on PSK31 on the numerous Web sites you can link to, as well as the original. Therefore, it is a good place to start.

Clicking on the *software available* takes you to a screen with links for programs to work with DOS, Windows, Apple, and Linux. I am not sure how all these different operating systems support PSK31, but some genius types must have it figured out. I am reasonably sure a soundcard has to be involved to make any of these programs work. Otherwise, it would seem

Continued on page 44

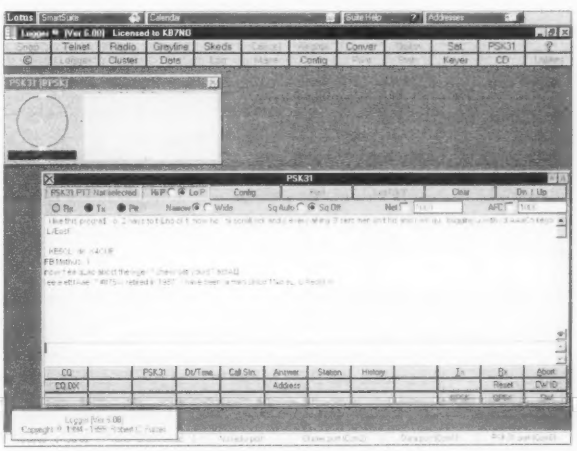

Photo A. *Talk about bells and whistles! This is just what you use to work PSK31 with Logger. The upper toolbar has to do with logging activities. The window with the circle at one end is the very effective tune system. The window labeled PSK31 pops up from one of those upper buttons. The first time you use it, you will grab the edges and bring it out to size. The 27 buttons at the bottom are all programmable. An excellent PSK31 program, but much more. Could be one of the handiest pieces of software in the shack. (Once we learn to use it all.)*

continued from page 43

the DSP and narrow bandwidth wouldn't be available.

As I mentioned, I am not sure just how compatible most laptops are with this mode. After all, they do not have plug-in Creative Labs soundcards. They tell me the laptop sound system is meant to emulate the standard Creative Labs fare, but then so are a lot of regular soundcards that just aren't quite compatible with certain software and accessories.

I did run into a few problems. The program installed and started to work as expected, then it got finicky. It didn't respond to clicking certain buttons, and I wasn't satisfied with the height of the displayed signals on the spectrum analyzer. I sent the author an E-mail, and he was very prompt in getting back with a few suggestions.

As (good) luck would have it, I put the laptop through some normal activity, and went back to the Logger program, and things started to work. I can only make some assumptions having to do with a nearly incompatible computer. Obviously, the software doesn't grow bugs and then shed them. And when the software works and you figure out about one tenth of the bells and whistles, it really is a winner.

Learning time

There was a little exercise I had to go through that teaches a few valuable lessons. The answer to getting the reading on the spectrum analyzer easier to read was to increase the audio level. So I brought up the Control Panel in Windows95™ and selected Multimedia. Sure enough, the volume controls are there.

Sliding one of the controls made the spectrum analyzer very easy to read. But, at the same time, the signal to the radio exceeded its limit and I had an overdrive problem. I discovered this for sure during a contact. I found if I used the proper sequence, I could have the volume control panel up at the same time I was transmitting. After some experimenting I arrived at a compromise between the drive to the radio and the spectrum analyzer.

That was a good lesson. However, if I describe it in detail, I am afraid your copy of Windows will vary from mine and it gets confusing. The software folks do list a procedure for setting these controls.

There is one other lesson you must keep in mind. PSK31 is still very new. Most of the contacts you make are with hams who only have a few weeks more experience than you. It is difficult for the fellow at the other end to give you sound advice according to what he sees displayed on his screen. You are a pioneer on the cutting edge as soon as you get this software and a few cables plugged in and make a contact.

There are a lot of rigs out there, and each has its own peculiarities. Some of them are a little more difficult to prod into operation with this new mode. The problems include overdrive of both the computer on receive and the transmitter on send. Most of the time, this is handled by using the accessory jack on the rear of the transceiver.

In the case of the ICOM 735 here, it has worked out well both to the desktop and the laptop from the accessory jack with simple, straightforward cabling. Some very good older transceivers do not have this convenience, and it is necessary to use the microphone input and the speaker output to interface with the soundcard.

There are numerous instructions for attenuators (found on the Internet links) to get the correct level of audio going between the radio and the computer. I noticed a recent article in the August issue of *73* where the ElectroKit people are furnishing a kit to overcome this dilemma, and that kit shows up on this same Web site I am referring you to. It sells for about $15, or you can buy it assembled for about $25. Sounds like a cool move by someone answering a need.

I still recall an old WWII surplus CW filter that was 20 cycles wide! That is so vivid to me. The real remembrance of that piece of equipment was of the drift on the old Hallicrafters receiver I had that would allow a CW signal to pass through that narrow bandwidth and be readable for approximately a half minute. Then it was time to go hunting again.

There is no comparison to that old-timer when I work with this ICOM 735 or any other modern-day transceiver. And we do work with each other's equipment when we communicate with these new modes because if both rigs aren't stable, the communication stops right away. You seldom hear of complaints of drift these days on most (other) modes.

Local packet

I attempted to find a simple solution to the local packet demise and there doesn't seem to be an

Current Web Addresses

Source for:	Web address (URL)
HF serial modem plans + software	http://www.accessone.com/~tmayhan/
SV2AGW free Win95 programs	http://www.forthnet.gr/sv2agw/
BayCom — German site	http://www.baycom.de/
Pasokon SSTV programs & hardware	http://www.ultranet.com/~sstv/lite.html
New Mode — PSK31 — Free download	http://aintel.bi.ehu.es/psk31.html
Baycom 1.5 and Manual.zip in English	http://www.cs.wvu.edu/~acm/gopher/Software/baycom/
Source for BayPac BP-2M	http://www.tigertronics.com/
TNC to radio wiring help	http://freeweb.pdq.net/medcalf/ztx/
ChromaPIX & ChromaSound DSP software	http://www.siliconpixels.com/
Timewave DSP & AEA products	http://www.timewave.com
International Visual Communication Association — a non-profit organization dedicated to SSTV	http://www.mindspring.com/~sstv/
XPWare — TNC software with sample download	http://www.goodnet.com/~gjohnson/
Auto tuner and other kits	http://www.ldgelectronics.com
TAPR — lots of info	www.tapr.org
Creative Services Software	www.cssincorp.com

Table 1. *The infamous URL chart.*

Above & Beyond

VHF and Above Operation

C. L. Houghton WB6IGP
San Diego Microwave Group
6345 Badger Lake Ave.
San Diego CA 92119
[clhough@pacbell.net]

The Internet, a new frontier

The Internet and computers in general have promoted a big explosion in information available to the general public and amateur radio as well. While the Internet started out as a scientific forum for technical exchange, it has blossomed into everyone's lives at a most common level as computers and the everyday people use it to expand their horizons. It seems to me that I have become very much attached to my computer and my Internet provider as a source of information and contacts via E-mail.

Consider that answering a question from an interested amateur by postal mail is a one-on-one happening. If the letter gets printed in a column such as this one, everyone who reads the column is exposed to the information. On the Internet, there are "reflectors" where questions or information can be shared with a large group of interested amateurs. This "reflector" is normally devoted to items of interest to a particular group of individuals who subscribe. It's like asking a question to 1000 or so other amateurs who have similar interests. And it's like having a free calling card to a "Mr. Wizard" who might just have information pertinent to your question.

I don't pretend to be all-knowing about the Internet, as I am just experimenting with it myself for just pure enjoyment. There are so many different avenues for search and research, with interesting Web sites to explore to broaden your perspective, be they wide ranging or cover just a narrow field of interest. In my case, it's amateur radio and its applications to the upper frequencies in the microwave realm. This is a specific point of interest, but it's still varied in many different directions such as EME communications, SETI searches, radio astronomy, weak signal microwave, construction, and much more.

What you need to know to start to explore is who you can contact and what information you can obtain on the Internet. Well, if you are just starting to explore, here are a few addresses that will provide you with more information than you can shake a stick at or print in a day. Some of these locations point to other locations (links) of common interest, so this is just a beginning of amateur-related sites to explore.

Amateur Internet sites

[http://www.ham-radio.com/sbms/] — San Bernardino Microwave Society.

[http://www.g3pho.free-online.co.uk/microwaves/] — easy fix. It is just going away in this neighborhood. I have taken my portable packet station and driven about checking old listings, and nothing answers.

Ah well, good things have a way of decaying if they don't keep up with the times. I suppose I just have to look at my own experiences with expecting dependable communication via the system. I was just telling a fellow the other day if I sent an important message by packet, I followed up with some regular E-mail just to check to see if it arrived. The success rate was lessening rapidly.

I think the packet system has taught us a lot, though. In the '80s, that was pretty high tech. There wasn't much available to so easily pass messages, and it was a lot of fun. I would often search message headers and find useful information or someone searching for a bit of info I could pass on. I would still be doing it if I could, which means that some lingering bit of nostalgia made an impression.

URL changed

I got an E-mail from Dave W9CGI a week or so ago. He found a problem with the listing in the URL chart for the TNC-to-radio hook-ups. It seems the address had been changed and there was a convenient forwarding address but the Web page couldn't be found on the new URL. Dave tried it and so did I.

I contacted Gloria KA5ZTX, and she supplied the correct address. So that little problem is solved. Let me know when things like that happen. That chart is probably the most important reference in this column. Incidentally, that Web site, as I recall, has a book that sounds like the answer to many of these interface problems. I should take a look and let you know. Plus, there are some valuable hints on the site about working digital modes.

FYI — you don't have to cave in to the "monopoly"

There has been a lot of fuss over the various big guns in the Internet browser/service provider business — about how they take advantage of folks when they log on to the Internet. It seems that Netscape has been accused of hogging the action as the opening screen.

It never occurred to me what a problem that must appear to some folks. Honestly, I learned very early in the Netscape browser usage to set the browser so it opens with a blank screen. With the latest version I have (4.x), when this was accomplished it made an extra step (sorta) in that the browser has to be told to go on-line after it comes up. Otherwise, it won't look for anything out there in the world. I don't recall the steps to get rid of the auto-load of an opening screen but it is covered in the documentation.

So, recently, there was a questionnaire of preferences from Netscape, and suddenly I realized all the things I had missed in recent years by not going and reading and following the crowd. There really is nothing wrong with providing users with something to occupy their minds. But some of us already think our minds are full of the things we want there. Sometimes, "enough" is best determined by the consumer.

Everybody's doing it

I was reading a recent issue of *The Vision Newsletter* from the International Visual Communications Association, which is primarily meant to promote SSTV. There were some interesting activities, including an International SSTV DX contest that attracted more hams than I realized were involved in SSTV.

Two other topics caught my eye. One, there are awards now for Worked All States in various combinations including QRP. That QRP sounds enticing. Well, maybe more like a tough row to hoe even for someone with a *lot* of patience. Whoever wins that award will earn it.

The second notable article was about a half page devoted to PSK31. I guess it is true for more than just you and me. If any ham succumbs to the challenge of one of these modes, he is in for the long haul — gotta try 'em all.

If you have questions or comments about this column, please E-mail me at [jheller@sierra.net]. For now, 73, Jack KB7NO. 73

Peter G3PHO/Radio Society of Great Britain. Lots of links to other amateur locations and microwave points of interest, with pictures and very interesting microwave news.

[http://www.nitehawk.com/rasmit/] — W6/PAØZN. EME, SETI, astronomy, microwave. Another excellent site devoted to R&D interests and information sharing among the amateur community.

[http://www.nitehawk.com/rasmit/50UP.html/] — 50 MHz and Up Group, San Francisco Bay area.

[http://www.ourworld.compuserve.com/homepages/edmunn/] — Home page of Ed Munn W6OYJ (member, San Diego Microwave Group).

[http://www.qsl.net/wb9ajz/laser/] — WB9AJZ Web page on laser communications.

[http://solar.uleth.ca/solar/www/realtime.html] — Near-real-time MUF map.

[http://www.geo.mtu.edu/weather/aurora/] — The aurora page, including how it works.

[http://www.pfrr.alaska.edu/~ddr/ASGP/STRSCOOP/AURORA/EXPLA4.HTM] — Very interesting information concerning auroras and how they function.

Commercial locations

Most of these commercial Web pages require no introduction, as they are self-descriptive in their addresses.

[http://www.icomamerica.com/] — ICOM America.

[http://www.yaesu.com/] — Yaesu.

[http://www.kenwood.com/] — Kenwood.

[http://www.jameco.com/] — Jameco Electronics (parts).

[http://www.allied.avnet.com/] — Allied Electronics (parts).

[http://www.hp.com/] — Hewlett-Packard.

[http://www.rfparts.com/] — RF Parts Co. Great source for hard-to-find component parts, tubes, and devices for HF through SHF, RF power devices, switches, and other items.

[http://www.w7fg.com/] — Manuals.

[http://www.ramsey.com/] — Ramsey Electronics. Amateur test equipment and kits.

[http://www.nec.com/] — NEC Semiconductors (California Eastern Labs, supplier of NEC devices).

[http://www.shfmicro.com/] — SHF Microwave Supply. Supplier of microwave parts and Gunn diode oscillator devices, both new and some used.

[http://www.downeastmicrowave.com/] — Down East Microwave (DEM, supplier of 50 MHz and up amateur equipment, and home of microwave no-tune converters).

[http://209.239.34.153/murphyjunk/home] — Mike Murphy Surplus Electronics, a local haunt here in San Diego with lots of test equipment and pieces parts in general.

[http://rio.bldrdoc.gov/timefreq/] — WWV, Boulder CO. NIST time and frequency home page.

[http://www.arrl.org] — ARRL headquarters Web page.

Well, there are a lot of addresses to check out that range from amateur suppliers to kit manufacturers to bulletin boards for amateur interest groups and surplus dealers. These by no means comprise the entire list, but rather a sampling of addresses I have observed, purchased material from, or used for technical information.

If you use your imagination, you can come up with addresses by using search engines such as: [http://www.yahoo.com/], [http://www.hotbot.com/], [http://www.bigfoot.com/], and [http://www.lycos.com/].

Call up these search engines and follow the bouncing ball. Each has a different personality and skill in finding slightly different things that you might want to do research on. Give them a try, but don't be too broad in your scope or so much will come up that you will not have a meaningful session. I once tried "Indian" and I received over 15,000 suggestions. Be more specific in your request by using a tribe name or specific item.

Using "amateur radio", I came up with 44 hits and 1477 sites for information. Refining the search to "amateur radio + microwave", I got 15 hits, one of which was Down East Microwave's site listed above. A very interesting site included in this listing was that of Bats, Cats, and Rats, which stands for Bay Area Telecommunications System, California Amateur Telecommunications System, and Radio Amateur Telecommunications System. This site is prolific in directing you to many different varied points of interest such as DX, clubs, professional organizations, commercial, state organizations, emergency, and amateur-related sites of interest. This is a very organized site, so give it a try at [http://www.kf6ny.org].

The amount of information you can gather by searching these and other sites is so vast that it boggles the mind. Don't let the keyboard and Internet access stop you from exploring these and many more interesting Web pages and locations on the Internet. The many varied points of interest can serve you very well with information or just with fun in surfing the Web.

By bringing up manufacturer's Web pages, you can research their specifications on component parts and obtain a copy of their data sheets. This has proven to be of great interest to me, as having semiconductor data manuals on all the component parts we use these days means having so much paper on the shelves that it can get overwhelming. I have quite a time trying to find one data manual at times in this sea of data books. Calling up the manufacturer, let's say NEC for instance, I am at their data book on-line and can browse about it looking for a device or call up an exact part and see its data almost immediately.

For work, I needed a data sheet on a particular item from a company in Canada. Searching the Web for that company, I found them and inserted the product I was looking for in their query search box on their Web page. It gave me the entire 12-page document, including module schematic and specifications in an Adobe Acrobat "pdf" file format to download. Was I impressed with this file transfer method! The file compression requires an Adobe Acrobat program that costs a few hundred dollars, but it's worth it. The program to open and expand the received "pdf" file is a free download file program available from Adobe Acrobat on their Web site [http://www.adobe.com].

This is a software company and they have many other programs that they offer for sale, but the Adobe Acrobat Reader program is available from them for free downloading from their Web site. I have purchased their program to encode documents and other material into the "pdf" format for transmission, and am in the process of learning how to utilize the software.

Addresses of microwave interest not mentioned before

[http://iacs5.ucsd.edu/~jkeyzer/projects.html] — Jeff Keyzer's page. Lists San Diego Microwave Group 10 GHz transceiver conversion project, double conversion 992 MHz/144 MHz, IF freqs, synthesizer-controlled.

[http://www.ham-radio.com/wa6cgr/mwpll.html] — Description of a microwave phase-locked loop/brick oscillator by WA6CGR.

[http://www.tapr.org/~n6gn/ocar/n6izw.html] — Description of SDMG's 10 GHz microwave X-band repeater.

Methods of searching on the Internet

Well, searching the Web on these "search engines" (as I learned to call them) such as Yahoo is not difficult. Like I said, all you have to input is a

CALENDAR

Listings are free of charge as space permits. Please send us your Calendar Event two months in advance of the issue you want it to appear in. For example, if you want it to appear in the January issue, we should receive it by November 30. Provide a clear, concise summary of the essential details about your Calendar Event.

OCT 16

GODFREY, IL The Lewis & Clark Radio Club will hold their Midwest Amateur Radio & Computer Expo at the Lewis & Clark Community College in Godfrey IL, in the River Bend Arena. Free parking. Indoor flea market, commercial vendors, all handicap accessible. Doors open at 8 a.m. Setup Fri., Oct. 15th after 6 p.m., or Sat., Oct. 16th at 6 a.m. Tables $10 each; call *(618) 254-9465* for reservations. VE exams: Pre-registration is required for "No Code" exams. Walk-ins are okay for all other class exams. For pre-registration or info call *Rich Morgan KF9F, (618) 466-2306*. For info and tickets, write to *Lewis & Clark Radio Club, P.O. Box 553, Godfrey IL 62035; or call (618) 466-1909*. Talk-in on 145.230 and 442.225. E-mail *[N9WHH@ezl.com]*. Visit the Web site at *[http://WWW.EZL.COM/~LMILLER/LCRC.HTML]*.

GRAY, TN The 15th Annual Tri-Cities Hamfest will be held by the Kingsport Bristol, and Johnson City Radio Clubs, on Sat., Oct. 16th, at the Appalachian Fair Grounds, located off I-181 in Gray TN. A large drive-in indoor and outdoor flea market space is available. RV hookups. Admission is $5. Mail inquiries to *P.O. Box 3682 CRS, Johnson City TN 37602.*

OCT 17

KALAMAZOO, MI The 17th Annual Kalamazoo Hamfest will be held at the Kalamazoo County Fairgrounds, starting at 8 a.m. Vendor setup at 6 a.m. Advance tickets $3, $4 at the door. Trunk sales $5. For tickets/tables, send SASE to *Gary Hazelton N8GH, 75075 M-40, Lawton MI 49065.* For contact or info, check the Web site at *[www.qsl.net/ka8blo/hamfest.html];* or E-mail *[ka8blo@net-link.net].*

SELLERSVILLE, PA The RH Hill ARC Hamfest will be held at the Sellersville Fire House, Rte. 152, 5 miles south of Quakertown and 8 miles north of Montgomeryville PA. Talk-in on 145.31. Admission $5. VE exams 10 a.m.–1 p.m., all classes. Please bring documents. Indoor flea market spaces $12, table included. Outdoor spaces $6, bring tables. For further info, call the Hamfest Hotline: *Linda Erdman (215) 679-5764; 2220 Hill Rd., Perkiomenville PA 18074.* Web site: *[HTTP://WWW.RFHILL.AMPR.ORG].*

OCT 23

RICKREALL, OR The Mid-Valley ARES, of Salem OR, will present its 5th Annual Swap-Toberfest and Amateur Radio Emergency Services Convention at the Polk County Fairgrounds on Sat., Oct. 23rd. Talk-in on the 146.86(-) rptr. Doors will be open for the convention 9 a.m.–3:30 p.m. Swap table setup will be 6–9 p.m. Fri. night, Oct. 22nd, and on Sat. morning, Oct. 23rd, at 7 a.m. Only 2 pre-registered participants allowed per table during setup; all must register. Self contained RV spaces available, $10 per night. Commercial vendor space $25 (for 2 tables). Mail to *Mid-Valley ARES, P.O. Box 13848, Salem OR 97309.* Pre-registrations post marked by Oct. 8th will receive an extra door prize ticket with each registration. Registrations received Oct. 16th or later will be held for pick-up at the door. Features include meetings and seminars. Additionally, emergency communications vehicles will be on display from Marion and Polk County Emergency Management, Civil Air Patrol, American Red Cross, the Oregon State Police, and others as available. Advance tickets $5, $6 at the door. Age 12 and under free. Non-power swap tables $13 each (do not mix non-power with power). Power swap tables $15 each. For more info contact *Bob Boswell W7LOU, (503) 623-2513; or E-mail to [w7lou@goldcom.com].* To download a copy of the flyer and pre-registration form, surf the Net for *[http://www.teleport.com/~n7ifj/swaptobe.htm].*

OCT 24

LEBANON, IN The Boone Co.–Clinton Co. ARC will hold a hamfest at Boone County Fairgrounds, 8 a.m.–1 p.m. I-65 to Exit 138. VE exams nearby, 9 a.m.–11 a.m. For table reservations, contact *Sue Youkey N9NVE, (765) 436-2565 or E-mail [WK9D@in-motion.net].* For more info contact *Sara L. Lecklitner KB9OEZ, (765) 482-9152.*

OCT 30

WATERFORD, CT An auction will be held at the Senior Citizens Center in the Waterford Municipal Complex on Route 85. The event is sponsored by the Tri-City ARC Inc., and is open to the public at 10 a.m. Setup begins at 9 a.m. Handicapped accessible. Bring your equipment to be auctioned. Admission is Free. Talk-in on 146.97. For more info, contact *Austin Wolfe AA1SV at (860) 443-2459.*

OCT 31

DES MOINES, IA The Tikva Tracers ARC will host "Hamfest Iowa '99" in the 4H Building at Iowa State Fairgrounds in Des Moines. Talk-in on 146.22/.82. Seminars and "Ask the Experts" will be featured. Setup Saturday, 6 p.m.–9 p.m., and 6 a.m. on Sunday. Doors open Sunday at 8 a.m. One table for $10, $8 for each additional table. Electric $8. VE exams at 9:30. Contact *Cass Nemmers NØYMU, 670 36th St., Des Moines IA 50312; tel. (515) 277-6346; E-mail [hamfestiowa@juno.com].*

NOV 6

BELLEVILLE, IL The Scott Composite ARS, KB9PAU, will sponsor its 1st Annual Hamfest at the main campus of Belleville Area College,

Continued on page 50

topic and you should get some hits. To help you be more specific on searching, here are a few tips on requesting information.

First, use the correct spelling of the word you want to locate. The first time, I typed "nite-hawk" spelled wrong. You would not believe what Web page came up. I will leave that one to your imagination.

If it's spelled wrong, you miss your opportunity. Use several words to describe what you want to search for, such as red-hot tacos. In this case, you will get a hit for each word individually: red, hot, and tacos. If you want only red-hot tacos, then use quotation marks and you will get only "red-hot tacos" hits that contain those words in that order.

Another trick is to use (+) or (-) signs. For example, + "red hot tacos" - "recipes". In this case, you want only red-hot tacos but nothing to do with recipes. This way, you can be more selective in your search. Another tip is to use lower case so that you will find matches in *either* lower or upper case; if your search is capitalized, it will not return hits that are in lower case.

There are many other methods that are too numerous to be included here, but what you have been given will provide you with lots of enjoyment and a great deal of information on whatever subject you care to explore. If you want more information, try searching for "how to search" and see what you get. I haven't tried it, but I suspect that it might lead to success. Give it a try. Happy "amateur radio" + "microwave" surfing on the Web. Best 73, Chuck WB6IGP. 73

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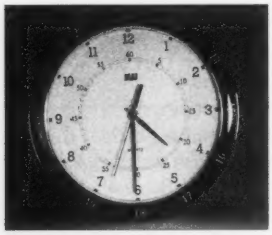
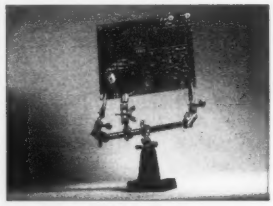
New Products



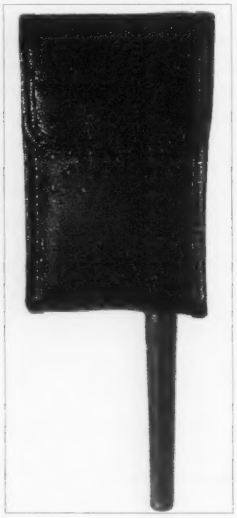


Mini News from MFJ

• MFJ's new model MFJ-126 is a beautiful quartz wall clock with a clear, clean, and highly visible 12-inch-diameter face. It's easily seen from 15–20 feet away. Also featured is a 24-hour trimline.

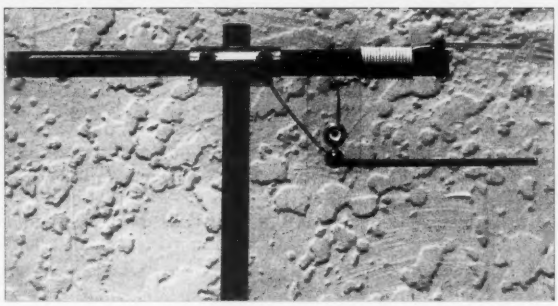
• New "Helping Hands" kit tools include (left to right) the MFJ-7104 4-inch tapered head diagonal cutter pliers ($6.95); MFJ-7106 6-inch all-purpose standard beveled edge wire cutters ($11.95); and MFJ-7114 4-inch needlenose pliers ($6.95).

• In addition, the Helping Hands bench assistant with 2-inch magnifier holds objects at any angle and leaves both hands free. #VEC-7400, $14.95.



Quick Draw Holster

The PowerPort Quick Draw holster from Cutting Edge has a few features that none of the other pouches around have. For one thing, it securely clips onto your belt and will not come off when you pull your HT out. And, it's made to hold your radio in the antenna-down position, which is much more comfortable and doesn't affect performance. $19.95. For details and model availability, contact Cutting Edge Enterprises, 1803 Mission St., Ste. 546, Santa Cruz CA 95060; tel. (800) 206-0115; E-mail [cee@cruzio.com].



Bilal's Isotron 6

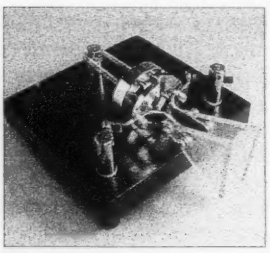
Bilal Company has announced that the new Isotron 6 for 6 meters is now available. With a bandwidth of 1.25 MHz at 10 W (may vary with environment), its compact design is 16.5 inches long by 2 inches wide by 4 inches high. Center frequency coverage is 50 to 54 MHz in two configurations, and two capacitive hats are supplied (50–52, 52–54 MHz). Feedline is 50 ohm coax, and pattern is omnidirectional with random polarization. Mount in any position; vertical gain will depend on height above ground.

For further information on this and other Bilal products, please contact Bilal Company, 137 Manchester Dr., Florissant CO 80816; tel. (719) 687-0650; [www.catalogcity.com], keyword Isotron.

PowerSafe 2000

It won't take a millennial shutdown to put Cutting Edge's PowerSafe 2000 power supply to good use. With the simple addition of that spare 12 V automotive battery in your garage or a deep-cycle marine battery, you can have a complete AC and DC power station. This compact and powerful 12 V rechargeable system offers a beefy 600 W (1200 W surge) of AC power and up to 200 amps of DC power. The PowerSafe 2000's sturdy vented battery enclosure is suitable for safe indoor use. Three AC outlets, a three-port DC cigarette outlet, automatic circuit breaker, male cigarette plug to energize y our equipment, and a fully automatic charger are all included. Dimensions are 18 x 10.5 x 9.5 inches. PS2000, reg. $369.95, sale $299.95.

For further details, contact Cutting Edge Enterprises, 1803 Mission St., Ste. 546, Santa Cruz CA 95060; tel. (800) 206-0115; E-mail [cee@cruzio.com].



Dual Paddle from China

Morse Express has announced the availability of a new dual paddle imported directly from China. At $79.95, it is among the least expensive of the "real" paddles — that is, heavy-duty and built to last. The Quadriom TA-1, made by the Quadriom Company in WuXi, uses a cantilever design (similar to Bencher and G4ZPY paddles) with steel needle bearings and nylon bearing seats. Contact spacing is adjusted by ordinary slotted-head screws, and held in place by set screws so that once proper adjustment is achieved, it can be locked in tight. Approximately 3-3/4 x 4 inches, 2-1/4 lbs.

For further information, contact Morse Express, Milestone Technologies, 2460 South Moline Way, Aurora CO 80014-1833; tel. 303-752-3382; E-mail [n1fn@MorseX.com].

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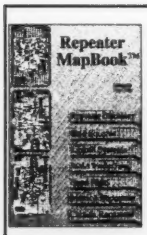

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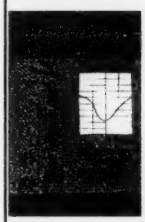

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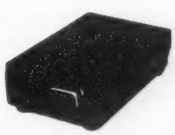

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CALENDAR

continued from page 47

Carlyle Rd. (Rte.161) and Green Mount Road in Belleville. Dealer tables are $10, tailgaters are $5. Dealer and tailgater setup 7 a.m.–8 a.m.; open to the public at 8 a.m.–2 p.m. General admission $4 at the door, $3 in advance. VE exams on-site, must be pre-registered. Talk-in on 147.120 on the St. Clair County Amateur Radio Club repeater, K9GXU. There will be workshops on emergency communications and the missions of Civil Air Patrol. Get tickets and pre-register by E-mailing senior member *Skip Mize KA9VKE at [fiuinc@peaknet.net], or calling (618) 277-9767.*

ENID, OK The Enid Hamfest Group will present a Hamfest on Nov. 6th in the Hoover Building at Garfield County Fairgrounds, Oxford & 4th. This event will be open to the public 8 a.m.–5 p.m. Admission $2. Tables $1 each. There will be a free doughnut and coffee in the morning, free hot-dogs and soda at noon. VE exams at 1 p.m. Contact *Tom Worth N5LWT, (580) 233-8473, E-mail [N5LWT@HOTMAIL.COM]; or Fred Selfridge N5QJX, (580) 242-3551, E-mail [FREDNNEL@IONET.NET].*

MYRTLE BEACH, SC The Grand Strand ARC is going back to basics for "Beachfest 99," with an outside fleamarket and tailgate-ONLY hamfest. No entry fee for visitors. Only $5 per spot for vendors. XYL cake and pie raffle only $1 per ticket. The event will be located at the Old Myrtle Beach Air Force Base just off Hwy. 17. Plenty of parking and vendor spots. The club will do the cooking for lunch, and there is a breakfast special large sausage biscuit w/ beverage for only $1.75. VE exams on-site in the Red Cross building, starting at 11 a.m. Contact *[WØRXR@w4gs.org]* for more info. Directions: US 501 to 17 By-Pass, go south on by-pass to the 2nd traffic light (about 3 miles). Turn left at the light and follow the signs.

SORRENTO, FL The Lake ARA's Hamfest and Computer Show will be held on Saturday, Nov. 6th at the East Lake Chamber of Commerce Building, located in Sorrento. Admission $5 per person. VE Exams, walk-ins only, at 10 a.m. Talk-in on 147.255. Inside vendors, $10 per table, includes one admission ticket. Tailgating $5 per vendor. For reservations and further info, contact *Chuck Crittenden KE4EXM, P.O. Box 615, Altoona FL 32702. Tel. (352) 669-2075, E-mail [capias@gate.net].*

WAUKESHA, WI The Milwaukee Repeater Club will sponsor its 15th annual "6.91 Friendly Fest" on Saturday, Nov. 6th, 8 a.m.–1 p.m. Sellers setup at 5:30 a.m. The Fest is being held at Waukesha County Expo Center Arena Forum, N1 W24848 Northview Rd., Waukesha WI. I-94 to County J, south to FT, west to Expo. Tickets $5. 4-ft. tables $5. Please call *Mike N9NPB at (414) 367-3953.* Send an SASE with payment to *The Milwaukee Repeater Club, P.O. Box 2123, Milwaukee WI 53201. Web page [http://www.execpc.com/~mrc/friendlyfest.htm].* Talk-in on 146.91(-) (The Friendly Repeater), and on 146.52. On-site VE exams.

NOV 7

KAUKAUNA, WI The Starlite Club at the corners of Hwy. 55 and Cnty. Rd. JJ, is the location for the Fox Cities ARC Annual Hamfest on Nov. 7th. Doors open at 8 a.m.; setup is at 6 a.m. Power available. You must buy an admission ticket if you pre-register. Advance tickets $4 each, 8-ft. tables $8 each. Send check or money order payable to *FCARC, 1912 Russett Ct. Apt. #7, Appleton WI 54914, Attn: Chad Pennings N9PRC, Hamfest Chairman. Tel. (920) 993-0485.* Advanced adm. must be received by Oct. 31st. VE exams: registration 8 a.m.–9 a.m., no walk-ins after 9 a.m. Bring original license plus (2) copies and photo ID. For more exam info contact *Cathy Keating N9FZL, (920) 766-3091.* Talk-in on 146.52 simplex.

LINGLESTOWN, PA The Central Pennsylvania Repeater Assn. 1999 Hamfest will be held at Linglestown's Fire Hall, Sunday, Nov. 7th, starting at 8 a.m. Handicapped accessible. VE exams on-site, compliments of HRAC. Call *Harold Baer KE3TM, 619 W. 2nd St., Hummelstown PA 17036, at (717) 566-8895* for table reservations. General admission $5. Tailgaters and vendors admitted at 6 a.m. Sunday. Talk-in on 145.470 and 146.520 simplex.

NOV 13

MONTGOMERY, AL The Montgomery ARC will host the 1999 Alabama ARRL Convention at the 22nd annual Montgomery Hamfest and Computer Show in Garrett Coliseum at the South Alabama State Fair Grounds, located on Federal Drive in the North Eastern section of Montgomery. Admission $5, free parking, all indoors, including the flea market. Flea market setup 3 p.m.–8 p.m. Nov. 12th, and 6 a.m.–8 a.m Nov. 13th. Doors open to the public 9 a.m.–3 p.m. CST. VE exams on-site beginning at 8 a.m. Bring original and a copy of your current license, picture ID and $4. Talk-in on 146.24/.84, W4AP. Ragchew 146.32/.92 (with phone patch, *up/#down), 147.78/.18, 449.50/444.50. Flea market reservations required to ensure table. Tailgaters welcome, $5 per vehicle space. For more info write to *Hamfest Committee, c/o 2141 Edinburgh Dr., Montgomery AL 36116-1313;* or phone *Phil at (334) 272-7980 after 5 p.m. CST. E-mail [wb4ozn@worldnet.att.net.* Visit the Web site for late-breaking news and events, *[http://jschool.troyst.edu/~w4ap/].*

NOV 13–14

FT. WAYNE, IN The 27th Fort Wayne Hamfest & Computer Expo will be held Nov. 13th and 14th at the Allen County War Memorial Coliseum Exposition Center. Sponsored by the Allen County Amateur Radio Technical Society. Hours: Saturday 9 a.m.–4 p.m. EST; Sunday 9 a.m.–3 p.m. EST. No advanced ticket sales. Admission $5 at the door only. 11 years old and under free with an adult. Coliseum parking, $2 per vehicle. Talk-in on 146.88(-). New and used ham dealers. Computers and software. Forums and meetings. Flea market tables, 8 ft., $20 each. Premium tables, 8-ft., $40 each. $27.50 for electricity (110V 20A). For info or table orders, send an SASE to *ACARTS/Fort Wayne Hamfest, P.O. Box 10342, Fort Wayne IN 46851.* For more table info, call *(219) 483-8163.* For general info, call *(219) 484-1314.* Visit the Web site at *[http://www.acarts.com].*

NOV 19–20

OCEAN SPRINGS, MS The West Jackson County ARC will hold its annual Hamfest/Swapfest at the St. Martin Community Center north of Ocean Springs. The hamfest will be open to the general public from 5 p.m.–9 p.m. on the 19th, and 8 a.m.–2 p.m. on the 20th. Admission will be $2 per adult or $4 for an entire family. Take Exit 50 South from I-10 at Ocean Springs. Follow Hwy. 609 to the second light. Turn right on Lemoyne Blvd., and the Community Center is 1 mile on the right side. Free parking. RVs may park overnight if they are completely self contained. There are several motels in the vicinity of Exit 50. 8 ft. tables are $5. Advanced deposits are required for sales table reservations. Talk-in on 145.11(-) MHz, N5OS. VE exams will be held at 11 a.m. Saturday. Bring photo ID, the original license, and a photocopy of that license. The testing fee is $6.45. Contact *Phil Hunsberger W9NZ, 1207 Lancelot Lane, Ocean Springs, MS 39564, tel. (228) 872-1499; or call Stan Hecker N5SP at (228) 875-0222.*

NOV 20

GOLDEN, CO The 1999 RMRL Hamfest will be hosted by the Rocky Mountain Radio League, Inc., November 20th, 8 a.m.–2 p.m., at Jefferson County Fairgrounds, 15200 W. 6th Ave., Golden CO (Indiana Exit from 6th Ave.). Talk-in on 144.62/145.22 MHz. Admittance $4 per person; tables $10 in advance or at the door. VE exams, ARRL forum. Contact *Ron Rose NØMQJ, (303) 985-8692; E-mail [nØmqj@arrl.net].*

NEWTONVILLE, MA The Waltham ARA/1200 RC Auction and Ham Social will be held Saturday, Nov. 20th on the 2nd floor of the Newton Masonic Hall, 460 Newtonville Ave., Newtonville MA (the corner of Walnut St. and Newtonville Ave., across from the Star Market). Metered parking on the streets. Masonic Hall lot reserved for other occupants of the building. Stay away from the Star Market lot, or they'll tow your vehicle. There is free parking in the municipal lot a block away. Admission

HAMSATS

Amateur Radio Via Satellites

Andy MacAllister W5ACM
14714 Knights Way Drive
Houston TX 77083-5640

Photo A. *The Phase 3D satellite from AMSAT takes a ride in August from Florida to Maryland for vibration testing. Lou McFadin W5DID and Stan Wood WA4NFY pack it in. (W3IWI photo)*

Photo B. *In Maryland at the Goddard Space Flight Center, Stan Wood WA4NFY makes a few adjustments to Phase 3D. (W3IWI photo)*

Amateur radio satellite activity is ready for a change, and it's coming fast. Phase 3D is done, it's ready for flight, and optimism is high for launch in the near future. While many hamsat enthusiasts have been watching and waiting for Phase 3D, there's been a quiet, deliberate campaign by other ham groups and educational institutions to design, build, and get launches for a new and exciting crop of satellites.

The good ...

Have you heard of JAWSAT, ASUSat-1, OPAL, FalconSat, or StenSat? These are a few of the good, new satellites scheduled for flight later this year, from Vandenberg AFB in California. They are to be launched together in a rather curious configuration.

JAWSAT is a name given to a device called the Multi-Payload Adapter (MPA). The name "JAWSAT" is probably derived from its shape, with openings around its periphery for the attachment of other satellites, like ASUSat-1, OPAL, and FalconSat. While JAWSAT may be the "mother ship" for these satellites, it also carries several cameras to monitor the deployment of the "child" satellites and a ham-radio store-and-forward communications experiment for use after deployment is complete.

ASUSat-1 is an Arizona State University NASA Space Grant project. It has been called a "nanosat" due to its light weight (around 10 lbs.) and small size. Although it is primarily a test bed for student experiments, it also carries a digital and an analog (voice) amateur-radio system on Mode "J" (two meters up and 70 cm down). Check out the ASUSat Web site at:

[http://www.eas.asu.edu/~nasasg/asusat/main_asusat.html].

OPAL is the second SSDL-SQUIRT (Space Systems Development Laboratory's Satellite

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$2. Talk-in on 146.64(-) Waltham rptr. Seller check-in starts at 9:30 a.m. For directions and further info, visit the WWW site at *[http://ourworld.compuserve.com/homepages/emayer/auction.htm]*, or contact *Eliot Mayer W1MJ, (617) 484-1089; E-mail [w1mj@amsat.org].*

SPECIAL EVENTS, ETC.

OCT 17

CINCINNATI, OH A Special Event Station will operate 10 a.m.–6 p.m. to commemorate Cincinnati OH's "Tall Stacks 99." The station will be operated from on board the *Belle of Louisville* Steamboat Paddlewheeler, by Nelson WB8VUU and Paula KA8HQJ DiGennaro of Huber Heights OH. The station will be carried on the Fairfield ARA's 145.19(-) wide area repeater, which covers up to seven states. They will operate under their individual callsigns. A commemorative QSL card will be offered to those making contact with KA8HQJ or WB8VUU. Send your QSL info along with an SASE to *Tall Stacks Special Event Station, 7136 Pineview Drive, Huber Heights OH 45424-2556 USA.* Allow up to 30 days for return of the commemorative QSL card.

OCT 31

BREVARD, NC The Transylvania County ARC will operate K4HXZ from Transylvania County NC on Halloween. Hours of operation will be from 1800Z until 2359Z on Oct. 31st. Frequencies will be 7.237, 14.295, 21.365, and 28.335 SSB, and 146.52 FM simplex. For certificates, send a business size or 9 x 12 SASE to *T.C.A.R.C., P.O. Box 643, Brevard NC 28712 USA.* Weather permitting, operation will be from The Devil's Courthouse on the Blue Ridge Parkway.

NOV 11

ALBUQUERQUE, NM Station N5VA will operate from the Veterans Medical Center on Veteran's Day, Nov. 11th. Operation will be 16:00 UTC–04:00 UTC on 14.287, 21.325, 18.130 and 7.245 MHz, or as close to those frequencies as possible. For a 9" x 11" certificate, please send a large SASE to *VA Medical Center, 1501 San Pedro Dr. SE 117D, Albuquerque NM 87108 USA.*

NOV 20–22

VALE ISLAND, NORTHWEST TERRITORIES In celebration of the 5th Anniversary of the US Islands (USI) awards program, VE8JR will be active exclusively around 28.495 from Vale Island. Operation will take place during the ARRL November Sweepstakes Contest, Nov. 20th–22nd. 17m activity will also take place from Northwest Territories and Alaska after the contest. *QSL Mgr. KL7JR (CBA).* Web site at *[http://www.eng.mu.edu/~usi].* 73

Photo C. *The "Earth" side of Phase 3D has sprouted many antennas in this pre–vibration-test photo. (W3IWI photo)*

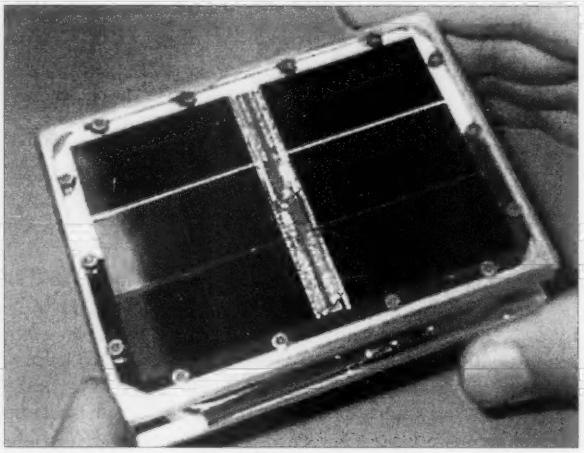

Photo E. *StenSAT is a real hamsat with a Mode "J" FM transponder, even though it's only about as big as a wallet. (StenSAT project photo)*

Quick Research Test bed) experiment from Stanford University. The first SQUIRT experiment, SAPPHIRE is still waiting for a launch. OPAL stands for Orbiting Picosatellite Automated Launch. OPAL is attached to one side of JAWSAT and carries a number of very small satellites. OPAL's primary mission is to demonstrate the feasibility of launching multiple "picosats" (very small 1-lb. satellites) while carrying a few other integral devices including an accelerometer and magnetometer test bed. Check out the OPAL Web pages at: [http://ssdl.stanford.edu/opal/index.html].

FalconSat is a project that has a lot of similarity to AMSAT microsats, but it's actually an Air Force Academy student project that uses non-ham frequencies. It is also to be included in the JAWSAT configuration.

The big ...

We've been hearing about it for years from AMSAT groups around the world: Phase 3D. Recently there were only two hurdles left for Phase 3D, vibration testing and launch. Vibration testing is complete. Now all we need is a ride to orbit.

In August, Phase 3D went for a ride in a rented truck, from Florida to the Goddard Space Flight Center in Maryland. Before a satellite is sent to orbit, it must be tested to make sure it will survive the rigors of space, and the ride to get there. The satellite has been tested for thermal and vacuum tolerance, but vibration tests were needed to make sure this rather large (over 6 feet in diameter and several hundred pounds) hamsat would still work after a ride on a rocket.

Phase 3D was structurally reworked after data was in from the first flight of an Ariane 5 rocket. In addition to a disastrous end, the first Ariane 5 flight was much rougher than expected and the vibration specifications for any prospective future payloads were tightened considerably.

The vibration tests at Goddard mark a significant milestone for the Phase 3D team. For the vibration tests, the satellite needed to be complete. Only the solar array pyrotechnics, used to allow deployment of the panels after arriving on orbit, were left out. Also, the fuel tanks were filled with a mass substitute rather than actual fuel. The results of the vibration tests were excellent. Just add some explosives, UDMH (Unsymmetrical Dimethyl Hydrazine), ammonia and some other good stuff for a big hamsat, and go for that final ride to space. Optimism is high for a launch in the near future. AMSAT President Emeritus Tom Clark W3IWI took some really nice photos of Phase 3D during its stay at Goddard. Some are presented here, and others can be seen at Tom's Web site on the Internet: [http://www.clark.net/pub/tac/p3d.htm].

It's easy to forget some of the incredible modes that Phase 3D can handle. New names for the modes of Phase 3D are a bit less cryptic than Mode "B", "J", and others from the past. Due to the wide range of microwave gear on Phase 3D, there will be some really exotic frequencies on board, but there will be some old favorites, too. An early preferred mode via Phase 3D will be Mode "UV", for UHF (70 cm) up and VHF (two meters) down, like Mode "B" that made its

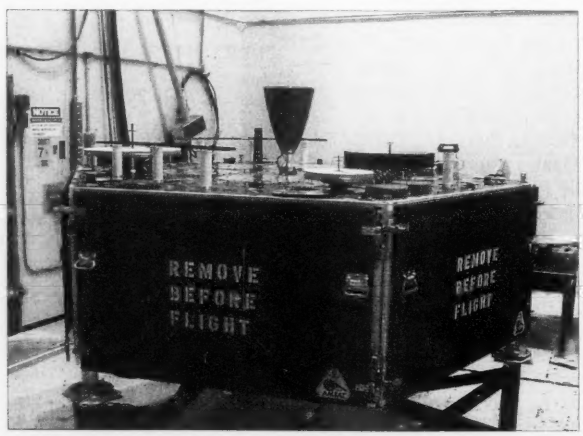

Photo D. *Ready for transfer to the vibration-test chamber, Phase 3D is complete. (W3IWI photo)*

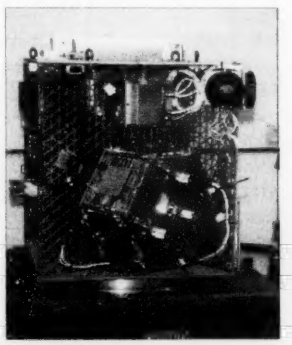

Photo F. *StenSAT is a small part of OPAL (Orbiting Picosatellite Automated Launcher). OPAL is shown attached to the MPA (Multi-Payload Adapter), also known as JAWSAT. (Opal project photo)*

Number 53 on your Feedback card

On the Go

Mobile, Portable and Emergency Operation

Steve Nowak KE8YN/4
1011 Peacock Ave. NE
Palm Bay FL 32907-1371
[pangen@compuserve.com]

Even more Y2K

The experts say that every idea goes through several stages on its way to acceptance. The first stage is ridicule ("That's dumb and you must be crazy!"). The second is opposition ("We must stop this!"), and the third is acceptance ("Of course! Anybody could have seen how obvious this is!"). I believe we are firmly in the third stage with regard to the Y2K issue. Every day the newspaper has a report on some aspect of it, and the television medium is approaching it 'n their usual sensational way. The experts have come out of the woodwork to assist us with these problems. I've heard experts from every walk of life making recommendations on how to handle the problems that December 31, 1999, might bring. I've heard computer experts (of course), Navy SEALs (I've learned not to argue their qualifications), and some who seem to have jumped on the bandwagon just because there's a bandwagon on which to jump. Everyone seems to be getting into the act. If nothing else, this once obscure potential problem is now well known.

But as communicators, what have we done differently? We've examined some of the potential problems that might occur as part of Y2K failures. We then have looked at how amateur radio might fit in and what services we might be called upon to provide. We've discussed some of the equipment needs that we might have if available repeaters exhaust backup power. We've also discussed preparation and coordination with the agencies we might be called upon to serve. We've looked at how amateur radio may fit into the overall scheme of disaster support if there should be problems with power and/or communication at the turn of the year. How do these differ from what we would do in other types of disaster support? They really don't. These are the things that we would normally be expected to plan for, the only real difference being that we have a date and a time when we suspect that something might happen. Naturally, it is always easier to plan for something with definite parameters than for something vague and indefinite. At the very least this has been a good exercise in planning. Instead of this being something on our "To Do" list, many hams have gotten this planning on their "Done" list. But don't get too comfortable — all plans have a very, very short life span.

The biggest difference I've seen in the amateur radio community is a heightened sense of creativity. This has included new approaches to problems, as well as new evaluations of existing solutions. I enjoyed Thomas Miller WA8YN's ideas on emergency power in the July issue of *73 Amateur Radio Today*. I never thought of hooking an alternator to a small gasoline engine — yet this looks like a fairly inexpensive way to generate the 13.8 volts we need for most amateur radio equipment. Add a deep-cycle battery and you can keep a mobile rig going at low to medium power for quite some time.

I got a letter from Rick Aiello N2HTT, from New York, who raised a couple of interesting issues. He has an 8000 watt power generator, which he got because he lives in a rural area where power losses often accompany bad weather. Having lived in the snowbelt myself, I know all too well how storms and power outages go together. Lines ice up, become heavy and fall, and the power fails. Icy roads lead to accidents that can involve power poles, and power fails. High winds can bring about the same result as lightning strikes. Because of such eventualities, he has converted his generator to propane, which allows the generator to run for long periods without refueling. Propane is generally acknowledged to be a cleaner alternative to gasoline, and easier on the engine. For those of us who don't live out in the country this is an approach we might not have considered, since we expect power to be quickly restored in the event of an outage. Rural folks often must wait longer, since there are fewer people affected by the failure of a particular power line. He is looking for ideas to clean up the power output. Home generators are great, but since they are designed mainly for lights and appliances, I am not sure that the power would be clean enough

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debut with AMSAT-OSCAR-7 many years ago. Now AMSAT-OSCAR-13 Mode "S" enthusiasts will have new Mode "US" to chase on Phase 3D. It uses UHF up and S-band (2.4 GHz) down. Another favorite that got a tentative test on AMSAT-OSCAR-10 many years ago as Mode "L" is the Phase 3D version called Mode "LU". It has an L-band (1.2 GHz) uplink coupled to a UHF downlink. An exciting combination of Modes LU and US will be Mode "LS", with 1.2 GHz up and 2.4 GHz down. And that's just the beginning! The satellite has C-band, X-band, and K-band systems to provide some real alphabet-soup communications modes. For a complete list of the satellite's capabilities, check the AMSAT Web pages at: [http://www.amsat.org/amsat/sats/phase3d.html]. Also check the AMSAT lab Web site at: [http://www.magicnet.net/~phase3d] for the latest pictures of the satellite.

... And the tiny

Imagine a satellite so small that you could carry it like a wallet, in your back pocket. That's StenSat. This picosat is one of the tiny satellites to be deployed by OPAL, which will be deployed by JAWSAT, as described earlier.

The StenSat crew is a group of radio amateurs from the Washington, D.C., area. After a lot of Internet E-mail and brainstorming, it was agreed to build a satellite that could send packet telemetry at 1200 baud and also be used as a Mode "J" (two meters up and 70 cm down) single channel, FM transponder for voice contacts. With solar cells on the top and bottom, and antennas wrapped around the sides, StenSat looks more like a curious tape case or oddball power supply.

The name StenSat comes from Stenhouse, a large, old house without air conditioning where several team members lived shortly after completing college. Projects from those days included tennis-ball launchers, rail guns, and other curiosities. Now they're building satellites.

The solar panels can't generate enough power for continuous operation, and power output will be less than other satellites', but StenSat could be a very serious addition to the hamsat fleet. Watch for this one, and check their Web page at: [http://users.erols.com/hheidt/intro.htm]. 73

HOMING IN

Radio Direction Finding

Joe Moell P.E. KØOV
P. O. Box 2508
Fullerton CA 92837
[Homingin@aol.com]
[http://members.aol.com/homingin/]

Photo A. *Yevgeny Stavitsky UAØCA streaks up the trail on the 80 meter hunt. He is one of the originators of the Friendship Radiosport Games.*

City of Roses — and foxes

"Amateur Radio history is being made!" I lost count of the number of times those words were used during the second week of August. I said them, the organizers said them, and so did officials of the ARRL and the International Amateur Radio Union (IARU). The historic occasion was the first IARU Region 2 (North and South America) Amateur Radio Direction Finding (ARDF) Championships. Thirty-two world class foxhunters, about half from the USA and the rest from seven other countries, took to the fields and forests to find out who was the best. I'll tell how your countrymen (and women) did, but first a bit of history and background.

On-foot radio direction finding (also called foxtailing, foxteering, radio-orienteering and ARDF) has been an important sport in Europe and Asia for some time. The other two IARU regions have held national and international ARDF championships for twenty years, but it was not until 1996 that a North American (Kevin Kelly N6QAB) competed in one. (See "Homing In" for December 1996.)

Last year, six hams from the USA traveled to Hungary to take part in the ARDF World Championships there. (See "Homing In" for January 1999.) Dale Hunt WB6BYU, the USA's Team Captain for that trip, was told by IARU officials that it was time for the western hemisphere to begin holding its own regional championships, too.

With few exceptions, World ARDF Championships take place in even-numbered years. In between, the three regions are encouraged to hold regional championships. Dale knew that the 1999 Friendship Radiosport Games (FRG-99), to be held in Portland, Oregon, this August, would provide an ideal opportunity for the first such event in this hemisphere.

Begun in 1989 by Yevgeny Stavitsky UAØCA (**Photo A**) and others from Khabarovsk, Russia, the FRGs have convened every two years in one of four countries: USA (Portland), Canada (Victoria BC), Japan (near Tokyo) or Russia (Khabarovsk). As documented many times over the last eight years on the pages of *73*, the FRGs have always featured ARDF contests. It was USA's turn to host in 1999. Dale proposed incorporating the IARU Region 2 ARDF Championships into FRG-99, and the rest is history.

Forming the teams

USA and Canada are the only IARU Region 2 countries with ARDF activities at present. As USA's ARDF Coordinator, it was my task to organize Team USA for the championships. You probably read my call for participants in the January and May issues. The "Homing In" Web site and the weekly amateur radio media announced the forming of Team USA early this year. There were special ARDF presentations at the Dayton Hamvention and Sea-Pac.

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for sensitive electronics like computers and some radios. In my experience, sensitive electronics often require significant transient suppression or power conditioning. Since my experience is mainly in high cost medical equipment, tens of thousands of dollars in power conditioning equipment is inexpensive if it saves a million dollars worth of equipment.

Naturally, equipment of this type can be truly life and death impacting, so that is another excellent reason to protect it. For a home generator, it makes little sense to spend as much on power conditioning as a car or even the house itself costs. I suggested a heavy-duty uninterruptible power supply, but I'm sure there are other ideas that might help. Drop me a line or an E-mail if you have an idea or experience with the output of a small generator.

What ideas have you come across during this exercise in preparation? Has your club decided to do something different? Have you made better or different contacts with state or local agencies you might support? Has the ham community in your area been more involved with coordinated planning with disaster or emergency services? How about equipment — have you decided on additional equipment or a different type of gear to use in a future emergency situation? There are some exciting new developments in amateur television that might prove very useful — have you tried any of them? On the other hand, packet seems to have dropped in activity; are there new uses for packet?

Share your ideas before we hit the end of the year. Our planning for Y2K is not going to produce results for only this event. These ideas are ones that will be useful in the next hurricane, blizzard, tornado, or other disaster.

After we get through this, or watch it pass without any significant problems, we can then move on to other areas of the hobby. In these days when new products are ever smaller and have greater capability, the entire hobby may move to mobile and portable operations! Stick around — in any case, it's going to be fun and important. 73

Name	Call	From	Division
Dick Arnett	WB4SUV	Erlanger KY	OTM
Jerry Boyd	WB8WFK	Albuquerque NM	OTM
Bob Cooley	KF6VSE	Pleasanton CA	OTM
Kittee Custer	KB7WRD	Portland OR	OTF
Robert Frey	WA6EZV	Cincinnati OH	OTM
Kuon Hunt	KB7WRG	McMinnville OR	OTF
Marvin Johnston	KE6HTS	Santa Barbara CA	OTM
Harley Leach	KI7XF	Bozeman MT	OTM
Jack Loflin	KC7CGK	McMinnville OR	JRM
Gyuri Nagy	HA3PA	Melrose MA	OTM
Brian Peddicord	KF6DZN	Santa Barbara CA	JRM
Mike Peddicord	KE6OTM	Santa Barbara CA	OTM
Jay Thompson	W6JAY	Santa Ana CA	JRM
Csaba Tiszttarto	(none)	Staten Island NY	SRM
Aaron Wilson	KAØLWY	Beaverton OR	SRM

Table 1. *Final Team USA roster.*

I had no idea how many USA hams would sign up. It was a very pleasant surprise to receive 21 applications before the final deadline. Unfortunately, six had to drop out for personal reasons.

The Portland organizers decided to have separate male and female divisions for Old-Timers (OT, born before 1959), Juniors (JR, born after 1979), and Seniors (SR). Persons born from 1959 and 1979 must be Seniors, but persons of any age may choose to run in that division. Only Seniors are required to search for all five foxes; those in other divisions need search for only four. The omitted fox is different for JRs and OTs.

Table 1 shows the final Team USA roster. Old-timer males were divided into two subteams, based roughly on geography. WB4SUV, WA6EZV, and KI7XF were USA-North. Our other four OTs were USA-South.

My counterpart north of the border is Perry Creighton VE7WWP of Victoria, British Columbia. As ARDF Coordinator for the Radio Amateurs of Canada, he tried hard to recruit ARDFers from elsewhere in his country for this event. As it turned out, all five Team Canada members were from the Victoria area. Each had attended regular two-meter ARDF practice sessions in nearby forests for several years. I knew that they would be hard to beat.

Hams in the City of Roses know how to make visitors feel welcome. Most competitors, including April WA6OPS and I, arrived on the weekend of August 7–8. On Sunday, Rene KX7Z and Ann Berblinger treated us all to a trip to Multnomah Falls, plus the Bonneville Dam and its

Photo B. *The 80 meter finish was downhill, so most runners built up a lot of speed. Here comes Jerry Boyd WB8WFK of Albuquerque, who built his receiver/antenna set just in time for this event. His team (USA-South) won the silver medal.*

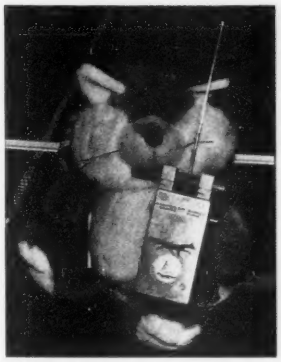

Photo C. *Ardee Fox was Team USA's official mascot, courtesy of April Moell WA6OPS. He's holding a typical European 80 meter RDF set.*

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Photo D. *Junko Ariyoshi JM1JKR and Yoshiko Yamagami JQ1LCW represented Japan. They are champions at ARDF in their home country and took Visitor gold and silver on both bands in Portland.*

Photo F. *They're off! Two competitors in different divisions were started every five minutes, coincident with the beginning of fox #1 transmission. Dick Arnett WB4SUV (USA-North) and 14-year-old Jay Thompson W6JAY are beginning the 80-meter sprint. Both were on teams that won gold medals at this event.*

generating facility. It was a great way to relax and get acquainted with foxhunters that we hadn't met before.

Monday and Tuesday were spent in training and preparation for the foxhunts to follow. It's unusual for two days of a championship event to be devoted to this, but it was a real boon to the Region 2 hunters. It gave them a chance to learn the most effective RDF techniques from willing teachers such as Rik Strobbe ON7YD, Chair of the Region 1 ARDF Working Group, and Panayot Danev LZ1US, ARDF Coordinator for Bulgaria.

Most of the US and Canadian hunters had never experienced ARDF on 80 meters. Jerry Boyd WB8WFK (**Photo B**) was the only North American who had his own receiver/antenna unit for that band. Rik and several other Europeans brought plenty of 80m sets (**Photo C**), so there were plenty to loan out for practice and for the 80m hunt on Thursday.

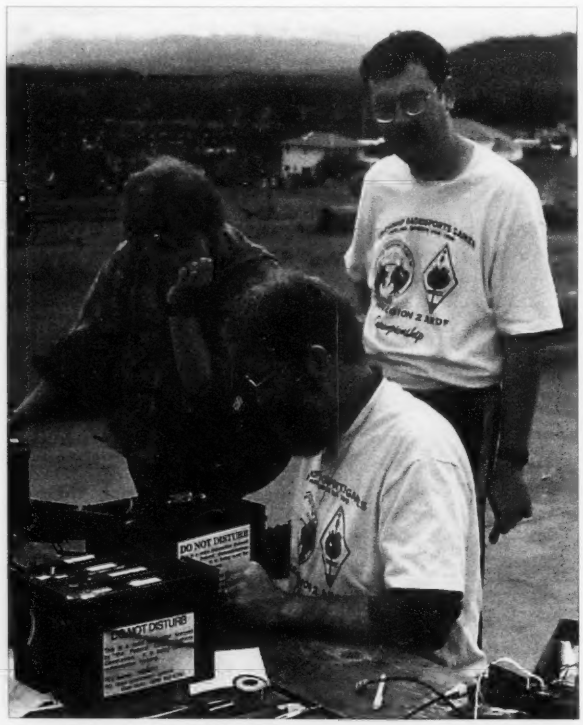


Photo E. *Dale Hunt WB6BYU, the Foxhunt Organizing Chair, makes last-minute repairs on an 80 meter transmitter, watched by Fay Loflin KC7OML, a Course Marshal, and Rik Strobbe ON7YD, the IARU Region 1 ARDF Working Group Chair.*

Region 2 vs. the world

All alarm clocks rang early on Wednesday, so everyone could make the 75-mile trip to Silver Falls State Park east of Salem, site of the two-meter foxhunt. Mist and occasional light rain made running conditions pleasant, except for the inevitable soaked shoes and socks. Fortunately, the finish-line shelter featured a fireplace that became a dry-out area.

As expected, the experienced visitors from Regions 1 and 3 had almost all of the top individual scores. Bengt Evertsson SM4VMU and Bryan Ackerly VK3YNG of Australia took the SRM division. Panayot Danev LZ1US of Bulgaria and Alexandr Kochergin UN7JR of Kazakhstan won OTM. Junko Ariyoshi JM1JKR and Yoshiko Yamagami JQ1LCW of Japan (**Photo D**) were top YLs. The exception was the Junior Male division, where Jack Loflin KC7CGK took first place. He did better than Stanislav Gorbatskiy of Kazakhstan, who had beaten Jack at last year's world championships in Hungary. All Team USA members returned within the time limit, avoiding disqualification. USA's SRM team won over the Canadian SRMs, but the well-practiced Canadian OTMs took the gold,

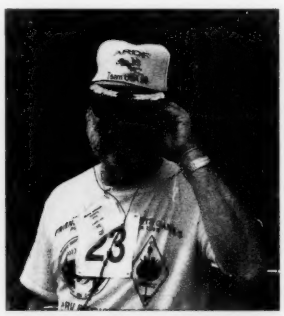


Photo G. *Marvin Johnston KE6HTS of Santa Barbara, wearing his Team USA cap, seems cool and calm after finishing the 80m run. His team (USA-South) took the silver medal.*

beating both USA-South (silver medal) and USA-North (bronze medal).

Could the Old-Timers of Team USA make a comeback in the 80m test on Thursday? Weather was much warmer and the site (Powell Butte Nature Park) was much closer. After some technical problems with the transmitter were resolved (**Photo E**), the contestants were off again.

In the SRM division, Gyuri Nagy HA3PA/KF6YKN streaked to the finish line in less than 36 minutes, beating second place SM4VMU by 8 minutes. Gyuri, who has resident status in the USA, had just received his USA callsign after taking the test a week before. Harley Leach KI7XF (age 57) took third place in the OTM division in an impressive 68 minutes. This time, USA-North (**Photo F**) took OTM Region 2 team gold and USA-South (**Photo G**) took silver.

After it was over and scores were tallied, everyone enjoyed a barbecue. Individual and team awards for both bands were presented by IARU Region 2 President Tom Atkins VE3CDM (**Photo H**). Each Team USA member earned at least one of the beautiful medals provided by Motorola. More importantly, each competitor took home many memories, lasting friendships, useful experience, and eagerness to tell everyone about the joys of ARDF.

Your town next?

Congratulations to the hams of FARS, and special thanks to Dale WB6BYU and Kuon KB7WRG Hunt. They took charge and turned the dream of this first-ever championship event into a reality. There's lots more to be said about it. I could go on about the excellent facilities at Reed College and the joys of setting out foxes just in the nick of time. But that will have to wait for another opportunity. Meanwhile, check the "Homing In" Web site for the complete individual and team scores, plus over 40 photos of this historic week.

You can be sure that all of the attendees are eager to share their experiences, too. If you live near one, invite him or her to talk at your local radio club. If ARDF sounds like fun for your ham club, school, or Scout group, get the ball rolling by putting on some RDF demonstrations and simple practice hunts, to get them hooked. Make on-foot ARDF a part of your club's hamfests, picnics, T-hunts, and other activities. Invite other clubs in the vicinity to participate, too. Make sure that your ARRL section and division leaders know of your efforts, as this will help them to understand the need for more League support of this sport.

By spreading the word about this exciting aspect of ham radio, you can help to make it a nationwide and hemispherewide activity. Talk up ARDF on the air, to your stateside and DX contacts. There are many other countries in IARU Region 2 that could and should be doing this sport.

Let the rest of us know what you are doing. Send ARDF news to me for this column, and make sure it gets posted to the Internet foxhunting mailing lists. Information on these lists, plus much more on all aspects of RDF, is at the "Homing In" Web site. 73

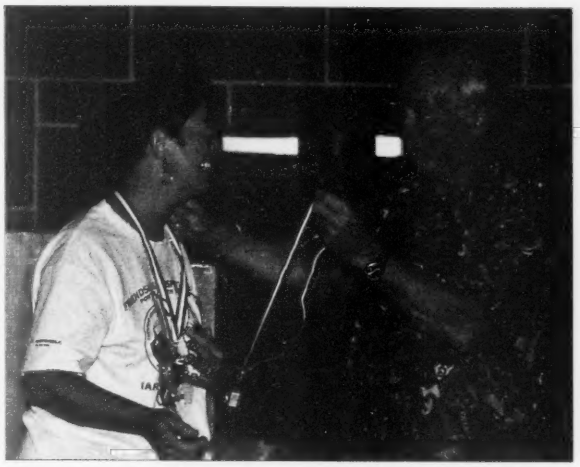


***Photo H.** IARU Region 2 President Tom Atkins VE3CDM (right) presented the medals. Kuon Hunt KB7WRG took Region 2 gold in her division on both bands.*

LETTERS

continued from page 8

parts A, B, C, or D, and also E, they cannot be classified as a person "doing business" with them. Requiring an SSN without meeting this condition violates the Privacy Act of 1974.

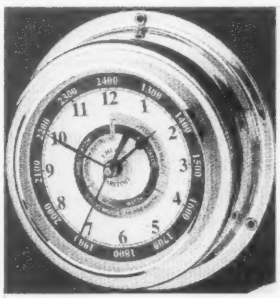
Further, note that under (3), even where it would be proper for the FCC to require an SSN, the FCC is not permitted to use the SSN as a unique database identifier, as it now does, but only in the collection and reporting of delinquent FCC administered debt.

(3) Each agency shall disclose to a person required to furnish a taxpayer identifying number under this subsection its intent to use such number for purposes of collecting and reporting on any delinquent amounts arising out of such person's relationship with the Government.

The FCC's use of the SSN/TIN as a database identifier also violates the Privacy Act of 1974.

Most amateur licensees, as well as the ARRL and their law firm, have overlooked these legal requirements. But they are important, as the Privacy Act is made completely ineffective without them. Any federal agency charging a fee, such as the Postal Service does for stamps, could similarly demand a SSN if they too misapplied the Debt Act, as does the FCC, clearly not the intent of Congress.

One final point that strongly indicates that the FCC is only interested in sneaking the SSN grab through is how they ignore their own incorrect interpretation of the Debt Act. They ride



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NEVER SAY DIE

continued from page 30

pleading that the bomb be demonstrated to the Japanese where it wouldn't kill people. General Groves made sure the petition never reached Truman, so he's the guy to be blamed for that unnecessary carnage. If we'd dropped Little Boy on a small Japanese island the message would have been loud and clear without destroying two cities and hundreds of thousands of people.

The book also discusses the dumping of radioactive waste into rivers and lakes, the carelessness with employee exposure to radiation, and so on. It's a grim reminder that we just can't trust our government.

It's an interesting book.

Sweet Deal

Maybe you missed the little item in a news magazine showing that members of the House Banking Committee got an average of $33,000 from commercial bank PACs vs. $500 average for House members not on the committee. The Banking Committee members got an average of $20,000 more from securities firms and insurance company PACs. One thing we know for sure — none of the legislation these PACs bought is going to benefit us. We're just the dumb suckers who keep giving these crooks their ticket to ride the gravy train.

Serendipity

Sherry has been after me to let you know about the *Better Generation* CD and cassette I made for Marty Balin—recorded in my studio. Remember the Jefferson Airplane and Jefferson Starship? Well, that was Marty Balin and his group. Marty needed a CD of his new songs to sell on his group's next tour, and he'd been so badly screwed by the major labels that he came to me. Marty claims he's made more royalties from this release than from anything his group had done in the past.

Anyway, just as I was getting Marty's CD and cassette ready to promote, a letter came in from Ian Zukswert of Broadalbin, NY. "I'm writing to let you know how much I enjoyed the CD *Better Generation* by Marty Balin. I happened on it at a record store in Albany. It's great to hear some super music by the extremely talented Marty Balin once again. He's a legend with one heck of a career and I appreciate your making it possible to hear some of his current tunes."

If you're into the "Jefferson" sound, you'll enjoy Marty's latest release. If you're interested, I'll make the CD or the cassette of *Better Generation* available for you for $5. While they last. Add it to your order on page 63.

Worse

As I sat one day, discouraged over how bad some things had gone, a voice came to me from the gloom saying, "Cheer up! Things could be worse." So, I cheered up, and sure enough, things got worse!

Strong-Arm Tactics

Oh, dowsing skeptic, you who haven't bothered to read any books on the subject, or to try even the simplest of dowsing techniques for yourself, I have a little test for you. A letter from an Art Bell listener triggered this.

Quite a while ago I reviewed the marvelous book *Vibrations*, by Owen Lehto. It's available from the Acres USA Bookstore, or direct from the author for $20 postpaid. See my *Secret Guide to Wisdom* for his address. Owen shows how anyone can test whether something is good for them to eat or not just by holding the item in the left hand (if they're right-handed) and letting the right arm hang down at the side. If the right arm makes small clockwise circles that's positive. It's okay. If it goes counterclockwise, it's no good for you.

I read the book, tried his system, and it immediately worked for me. So I went to the office and asked several of the people there to hold an apple in their left hand and let their right arm hang loose. I didn't tell them what was supposed to happen. You got it right, their arms made small clockwise circles. Then I put a piece of candy in their left hand and watched their right arm make counterclockwise circles. It worked for everyone!

Another approach is to hold the right arm out and have someone push down on it. The bad stuff makes the arm weak and easily pushed down. Good stuff makes it almost impossible to push down.

My correspondent used this technique to test for EMF effects from pole transformers. He found that arms began to lose strength at about 0.1 milligauss! The accepted radiation level has been 1.0 mg, with power companies accepting anything under 10 mg.

What I'd like to know is what effect our ham rigs are having on us. How about doing the arm test at different points in and out of your house to see what your body's milligauss meters says? Test first with the rig off to see what EMF field effects are there. Then turn on the rig and see what changes that makes. Let me know, okay?

You can also test for the effects of underground streams that may run under your home and be causing long-term health problems. You can read more about this in the dowsing books. And if your skepticism is at full force, know you that these underground stream effects have been measured with scientific instruments.

Told You So

With our fortieth anniversary coming up next year, we

---

the high horse of being a good federal agency helping to recover 100 billion dollars in bad loans by implementing what they claim to be a Congressional mandate to get SSNs of its licensees. But, part B says that recipients of a Federal license meet the requirements of B.

(B) An applicant for, or recipient of, a Federal license, permit, right-of-way, grant, or benefit payment administered by the agency or insurance administered by the agency. If the FCC's interpretation of the Debt Act is correct to their way of thinking, then they have to get the SSN of ALL their licensees, not just those applying renewing, or modifying them as they now are. They are, by their own interpretation, required to suspend or revoke the licenses of those persons already "doing business" with them not registering. Why don't they do this? What about all the FCC loans hams (I'd bet there are not any hams that have FCC loans) are about to default on before they renew their licenses?

Both *QST* and *CQ* act as if they are in complicity with the FCC in seeing that they pull off the illegal SSN grab. I'd hate to think that was the case, but the way Frederick Maia refers to hams who don't sheepishly acquiesce as "stubborn," and David Sumner's grasping at straws to bolster the scheme, suggests as much. I've written W5YI twice, but he has not acknowledged my letters. I get the feeling from Mr. Sumner that even though it's illegal for the FCC to demand SSNs, it's past the public comment period, ULS has come too far, and too many at the FCC are actively working on ULS to even question it anymore.

If those who want the FCC to follow the rules governing them the same as we have to follow FCC rules over us are stubborn, count me in, I'm proud to be one of them. This isn't about ham radio or even the SSN; it's about the rule of law and whether this country really has one, or if we have runaway bureaucracies exercising powers not granted them. 73

thought it might be interesting to take a look back at some of my columns from the days of yesteryear. Yeah, I know I put sugar in the applesauce recipe, but I've learned a lot since then. Have *you?*

35 Years Ago in *73* ...

Do It Yourself?

In all of the tumult over incentive licensing, there is one item that seems to be generally accepted: It would be nice if things were better. We all wish that operating in our lower bands wasn't quite so hectic, that more operators would be considerate, that more public service was being accomplished, that more of us would try building equipment and that we would all continue to improve technically. Not necessarily in that order.

All of these goals are worth tackling. Amateur radio will be the better for their success and our enjoyment of it will be just that much more enhanced.

The question is, shall we go after these objectives voluntarily, putting our own personal enthusiasm into them, shall we do it with a gun stuck in our back, or shall we just leave everything alone and let things fester?

My own belief is that we can accomplish all this ourselves without the FCC wielding a big stick.

Ham radio is one of the greatest hobbies in the world. Not only do we get entertainment from the use of it, but we are ready to help out in any emergency or disaster. Perhaps it is time that every one of us took a good deep look into ourselves to see what we can do to be a better amateur and to make amateur radio better. This means all of us, from the oldest old-timer to the newest Novice. All of us can help ourselves and ham radio.

What can *we* do? Let's take another look at those goals:

Courtesy
Wider use of available bands
Technical improvement
Home construction
Public service

Courtesy. Perhaps consideration would be a better term. All of us can devote time and effort to this, not only in being sure that our own behavior is impeccable, but in teaching others what is right and what is wrong on our bands. It takes great courage to speak up when someone has done wrong ... and great diplomacy. Diplomacy is not a born ability, it is learned through bitter experience. I find that few fellows get angry when I suggest an improvement in their equipment or techniques. I believe that the single greatest improvement to ham radio would be universal consideration.

Bands. To all practical purposes there is no QRM on the six and two meter bands. Neither is there any lack of activity. If you'll give them a try you'll find quite a few refugees from the furies of 20-40-80 up there. Ten needs you too.

Though all of these goals can be reached on a personal basis, many of them can be more effectively implemented through the group effort of an amateur radio club. Group action is the backbone of our hobby. Very few amateurs live beyond driving distance of a ham club. If every amateur would make it his business to attend club meetings and encourage his club to achieve the above goals we would enter a new era in our hobby.

Club discussions of operating practices are certain to be lively.

A club channel on ten, six, or two would certainly open new horizons for many of the members stranded in the jungles on 75 or 20. Group efforts might even get activity going on 432 mc, which is increasing in popularity rapidly these days.

Every club meeting should include a short *technical session* where some phase of radio is discussed. The technical topic can be assigned at the previous meeting and should be something that all members can bone up on ... perhaps a technical article in *QST* or *73*. Clubs that are interested in using any of the many such technical articles published in *73* can buy bulk copies of back issues at our cost plus postage. That's the least we can do. *Club projects* for building identical units is fun and profitable. The club can take advantage of bulk buying savings ... individual members can be sure that there will be someone to help them out of self inflicted difficulties. Turn to the back issues and handbooks, fellows. Construction is considered by many as one of the most exciting aspects of amateur radio. How about giving it a try?

Public service is easy. Club members should be able to come up with more suggestions than you can ever tackle. And don't forget to toot your horn when you turn in a good job ... write an article for the local paper.

Tithe

Your excuse is the same as mine, I just don't have time. What little time I have to spare I like to use to get on the air. This is just an excuse, a rationalization. Actually there are darned few of us that cannot spare one night a month to attend a club meeting ... and fewer yet that cannot spare a half hour or so a week to do some building and technical reading. If a fellow isn't interested enough in improving ham radio so that he is willing to invest one tenth of his hobby time in our common goals, how valuable an asset is he to the rest of us ... or to his country ... or to himself?

Please give some serious consideration to devoting a tithe of your time to bettering yourself and amateur radio.

30 Years Ago in *73* ...

...Wealth?

A few months back there was a snide reference in one of the other ham magazines to a little booklet I wrote a couple years or so back on *How To Make a $1,000,000.* I've mentioned this briefly in my editorials before, I realize, explaining that my interest in the matter is more academic than real.

This academic interest does lead me to read most of the books that come out on the subject of making money or keeping it, once you've made it. And that can be a problem too. In addition to the book by Lloyd Colvin W6KG on making a million in the home construction business, I might also recommend the pocket books on *The Rich and The Super Rich,* and *Atlas Shrugged.* The first of these was particularly interesting to me because it backed up my own deduction that college education not only does not help you to make big money, it in fact is a severe hindrance.

Fortunately for our school system, very few people seem to be even slightly interested in going for the big money. By big money I mean enough to permit you to retire and live comfortably from the invested capital, not millions of dollars.

Fortunes are not being *made* any more, just inherited. However, thanks to inflation, it is not at all difficult to gather together one little bitty million. This is being done quite frequently by those either shrewd enough to figure out the system or those lucky enough to fall into it. I suppose I should add a third group that ignore the system and get there by stealing.

Even considering Parkinson's Second Law (expenses will always rise to meet income), $1 million invested at a mere 5% should last you rather well. You won't be a big yacht customer or buy a Rolls, but at $50,000 per year, the wife shouldn't have to buy cloth coats for winter.

Naturally I recognize that the preponderance of *73's* readers are inescapably committed to their present life and that any discussion of a career is, for them, quite academic. On the other hand, few of us are not occasionally

Continued on page 61

PROPAGATION

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Payson AZ 85541
[jimpeg@netzone.com]

October

October does not begin well for DX signal propagation on the HF bands. As you can see from the calendar, propagation is expected to be Poor or Very Poor from the 1st through the 9th. A disturbed magnetic field and very upset ionosphere is likely to prevail during that period, and you may expect some other very pronounced geophysical effects on the 7th, 8th, and 9th.

"Conditions" should improve with chances for good DX propagation during the week between the 11th and 18th. However, strong geophysical disturbances will probably return with magnetic field upsets and an active ionosphere for the week between the 20th and 27th. A slight improvement and much better DX propagation is anticipated for the last three days of the month.

Your best opportunities for logging new and possibly rare countries will occur between the 12th and 17th and again on the 30th and 31st. Good luck and patience for the other days.

November

November will exhibit variable DX conditions on the HF bands, ranging from Poor to Good, as shown on the calendar. The days 1st–5th and 18th–22nd are expected to provide GOOD DX paths to most areas of the world, but signals may not be quite as strong as during the best days of September or October, due to the reduced E- and F-layer ionization at the onset of winter in the northern hemisphere.

POOR conditions for DX are expected on the 7th and 8th and again on the 25th and 26th, with the remaining days of the month trending between the extremes.

Those with good ears and good receivers will make the best of the FAIR conditions between the 10th–12th; the 15th and 16th; and again from the 28th–30th.

Atmospheric storms and other geophysical disturbances are also likely during the 7th and 8th and again on the 25th and 26th.

Happy Thanksgiving!

Band-by-band forecast

10–12 meters

Expect morning F2 path openings to Europe and Africa; on (G) days, midday path openings to South and Central America, and F2 path openings to Japan, Australasia, and the Pacific during the afternoon at your location. DX moves west as the day progresses.

15–17 meters

Expect good DX paths to most areas of the world, with excellent openings from the northern hemisphere to Africa, South America, and the Pacific during hours of daylight and peaking during local afternoon. Good short-skip communication over 1000 miles will occur on (G) days.

20 meters

Very good DX openings to all areas of the world from sunrise through the early darkness hours. The signals will peak an hour or two after sunrise at your location, and again during the afternoon. Short skip beyond about 700 miles will occur during daytime hours.

October 1999

SUN	MON	TUE	WED	THU	FRI	SAT
					1 VP-P	2 P
3 P-F	4 F-P	5 P	6 P	7 P-VP	8 VP	9 VP-P
10 P-F	11 F-G	12 G	13 G	14 G	15 G	16 G
17 G	18 G-F	19 F-P	20 P-VP	21 VP	22 VP-P	23 P
24 P-VP	25 VP	26 VP-P	27 P	28 P-F	29 F-G	30 G
31 G						

30–40 meters

Good worldwide DX openings from sunset to sunrise should occur on (G) days. Noise levels (static) will be higher if thunderstorms occur, and can depress audibility. Short skip between 100 and 1000 miles will occur during daylight hours, and at distances beyond 1000 miles at night.

80–160 meters

On 80, DX to the southern hemisphere and to Europe should occur after dark and during sunrise hours — limited, of course, by static noise levels. Daytime short skip to about 350 miles, and beyond 500 miles after dark, will prevail on (G) days. On 160, no daytime propagation will occur due to

EASTERN UNITED STATES TO:

GMT:	00	02	04	06	08	10	12	14	16	18	20	22
ALASKA	15/17	20/30	-	-	-	-	20/30	20/30	-	-	-	15/17
ARGENTINA	20/30	20/30	40	40	-	-	-	-	-	10/12	10/12	15/17
AUSTRALIA	15/17	-	20/30	-	-	40	20/30	20/30	-	-	-	15/17
CANAL ZONE	15/17	20/30	40*	40*	40	-	20/30	20/30	20/30	10/12	10/12	15/17
ENGLAND	40	40	40*	40	-	-	20/30	15/17	10/12	10/12	20/30	20/30
HAWAII	15/17	20/30	20/30	40	40	40	20/30	20/30	-	-	10/12	10/12
INDIA	-	-	-	-	-	-	20/30	20/30	-	-	-	-
JAPAN	15/17	20/30	-	-	-	-	20/30	20/30	-	-	-	15/17
MEXICO	15/17	20/30	40*	40*	40	-	20/30	20/30	20/30	10/12	10/12	15/17
PHILIPPINES	-	-	-	-	-	-	20/30	20/30	-	-	-	-
PUERTO RICO	15/17	20/30	40*	40*	40	-	20/30	20/30	20/30	10/12	10/12	15/17
RUSSIA (C.I.S.)	40	40	-	-	-	-	-	15/17	15/17	20/30	-	-
SOUTH AFRICA	20/30	-	-	-	-	-	-	-	15/17	15/17	10/12	20/30
WEST COAST	40	80	-	-	-	-	-	20/30	20/30	20/30	15/17	40

CENTRAL UNITED STATES TO:

ALASKA	15/17	-	-	-	-	-	-	-	-	-	-	15/17
ARGENTINA	15/17	20/30	20/30	40	40	-	-	-	-	-	10/12	15/17
AUSTRALIA	15/17	20/30	20/30	20/30	-	40	80	-	-	-	-	15/17
CANAL ZONE	15/17	20/30	20/30	40*	40*	-	-	15/17	15/17	10/12	10/12	15/17
ENGLAND	-	40/80	40/80	-	-	15/20	15/17	15/17	20/30	20/30	20/30	-
HAWAII	15/17	20/30	20/30	40	40	40*	80	20/30	-	-	10/12	15/17
INDIA	-	-	-	-	-	-	-	20/30	-	-	-	-
JAPAN	15/17	-	-	-	-	-	-	-	-	-	-	15/17
MEXICO	15/17	20/30	20/30	40*	40*	-	-	15/17	15/17	10/12	10/12	15/17
PHILIPPINES	15/17	20/30	-	-	-	-	-	20/30	-	-	-	-
PUERTO RICO	15/17	20/30	20/30	40*	40*	-	-	15/17	15/17	10/12	10/12	15/17
RUSSIA (C.I.S.)	-	-	-	-	-	-	-	20/30	15/17	20/30	-	-
SOUTH AFRICA	20/30	-	-	-	-	-	-	-	-	15/17	15/17	20/30

WESTERN UNITED STATES TO:

ALASKA	10/15	15/17	15/17	20/30	20/30	20/30	40	40	-	-	-	15/17
ARGENTINA	10/15	20/30	20/30	40-	-	-	-	-	-	-	15/17	10/15
AUSTRALIA	10/12	15/17	15/17	20/30	20/30	40-	40	40-	20/30	20/30	15/20	15/17
CANAL ZONE	20/30	20/30	40/20	40/20	40	-	-	20/30	15/17	15/17	10/12	10/12
ENGLAND	-	-	-	-	-	-	-	-	-	15/20	15/20	-
HAWAII	10/12	15/17	20/15	40	40*	40*	40	40	-	20/30	20/30	20/30
INDIA	15/20	15/20	-	-	-	-	-	-	20-	-	-	-
JAPAN	10/15	15/17	15/17	20/30	20/30	20/30	40-	40-	-	-	-	15/17
MEXICO	20/30	20/30	40/20	40/20	40	-	-	20/30	15/17	15/17	10/12	10/12
PHILIPPINES	15/20	15/20	-	20/30	-	40-	40-	-	20/30	20/30	-	15/17
PUERTO RICO	20/30	20/30	40/20	40/20	40	-	-	20/30	15/17	15/17	10/12	10/12
RUSSIA (C.I.S.)	-	-	-	-	-	-	-	-	20/30	-	-	-
SOUTH AFRICA	20/30	20/30	-	-	-	-	-	-	-	15/17	15/17	20/15
EAST COAST	40	80	-	-	-	-	-	20/30	20/30	20/30	15/17	40

NEVER SAY DIE

continued from page 59

put in the position of being able to influence a younger person, so perhaps a bit of thinking about careers and the future is not entirely out of line.

It is all too easy to try to pass along the values that we have been taught. I accepted without hesitation the idea that everyone that could should go through college. It never even occurred to me to question this. I think I have the matter in better perspective now.

A college education, complete with Master's degree, is worth every dollar and day to the fellow who wants to work for a large company for the rest of his life. The pay is good and the life is American Standard. Of course it means buying most of the big things on time payments for many, many years. The house will never be paid for, since advancement in business means moving into a bigger house every few years with attendant refinancing. Add car payments, boat payments, vacation payments, etc.

That little postcard from Cleveland Institute that we bind into *73* every now and then got me to thinking. I detest those darned things, but as a publisher I have to recognize the economics of my business and run them now and then. At any rate, I sent in one to Cleveland and in a few days one of their nice four color brochures arrived. The cover letter asked me, "Where do you want to be in life in one year ... in two years ... in three years from now?

My own plans are formulated, but I wonder how many of the younger amateurs have done much thinking about their future?

There are, obviously, many fortunes to be made in electronics. It is one of the fastest growing fields in the world today. This means opportunity. The big corporations will get bigger, naturally, but thousands of little companies will blossom out and make small fortunes for their entrepreneurs. The little booklet that I wrote on making a million dollars explains a very simple method of taking advantage of this growth, starting out with nothing and getting over the hump in a very few years.

One does not become a successful businessman by starting his own business any more than a concert pianist succeeds by going on stage with no experience whatever. Success requires a lot of hard work and luck. And the harder you work the luckier you get.

Something else has changed with the generations, too, I suspect. It may be my own special background, but in my youth it was not looked down on as a goal to work for wealth. Now, when talking with teenagers, I frequently find that they have no desire at all to make money. This may be apathy or it may be a reaction to parents that idolized money. It is frustrating, though, to have what seems to me to be a really simple way to almost unfailingly make a fortune and find that no one is listening.

How long do you think it will really be until we have space stations parked in our skies making wires across the Earth a thing of the past? Telephones in the shirt pocket. FM radio and TV from space. Instant accounting down to the smallest store in the country. Letters and photo copies anywhere instantly. The hardware and software for this boom will be manufactured by new companies, and hams will plan an important part. The youngsters that recognize this now and get ready for it will be the winners. Ham radio is an excellent start. And courses such as advertised by Cleveland Institute can't but help.

It might be inspirational for the younger members of your radio club if you invited some of the older members who have used their background in ham radio and parlayed it into success to give a talk. If you don't have any real success stories in your club, look around your local area and you'll find them.

Much of the hard work they will tell you about, and which is a key ingredient of their success, is education. It may not be in college, but it could be self-education, reading, mail study courses, and brain-picking every expert you can corner.

Before you sit down to write a heated letter hating me for discussing such outrageous ideas, please take some time and marshal your facts. I will bow to documentation and facts, not to steam and emotion based upon disturbed beliefs. As always, I will most enthusiastically publish further thoughts along this line, pro or con.

Reactionaries

The next time you run into someone on the air or at a club meeting that gets mad when you try and discuss methods of improving the ARRL, just remember that reaction is a very normal human condition. The human body tends to reject the transplant of foreign tissue on it. This certainly is rather parallel to the way in which any mind tends to reject any idea which seems unfamiliar or which threatens an existing system. The intrusive forces are sloughed off or ignored, just as an aging lion tamer resists the decision of a circus manager to buy more lions, or just as an executive tends

How long do you think it will really be until we have space stations parked in our skies making wires across the Earth a thing of the past? Telephones in the shirt pocket. FM radio and TV from space. Instant accounting down to the smallest store in the country. Letters and photo copies anywhere instantly. — Wayne Green W2NSD/1, in 1969

ionospheric absorption of signals, but after dark, peaking around midnight and again during the predawn hours, you should be able to work many areas of the world. Short skip from 1000–2000 miles or so will prevail during the nighttime hours ... but, as always, it will be limited by high static levels from thunderstorm activity.

Don't forget to work the *darkness path* (±30 minutes around local sunset).

Check the bands above and below the suggested ones for possible DX surprises. It's often a good idea to park your receiver on a seemingly unused frequency and just wait. A DX station is very likely to pop up before any one else hears him, and you can snag a good catch.

Please note that the Band-Time-Country chart is the same for both October and November. (*) indicates a possible 80 meter opening, and (-) indicates a difficult path. Good hunting! W1XU/7. 73

November 1999

SUN	MON	TUE	WED	THU	FRI	SAT
	1 G	2 G	3 G	4 G	5 G-F	6 F-P
7 P	8 P	9 P-F	10 F	11 F	12 F	13 F-P
14 P-F	15 F	16 F	17 F-G	18 G	19 G	20 G
21 G	22 G	23 G-F	24 F-P	25 P	26 P	27 P-F
28 F	29 F	30 F				

to resist the decision to computerize a business, forcing him to grow into new skills.

Ideas must be presented slowly and cautiously, always equating them to previously understood concepts, if they are to be accepted. It is all too easy to leap into a conversation, as I frequently do, presenting the solutions to problems rather than the groundwork for understanding the problems, which will in turn lead to the obviousness of the solutions. Don't do as I do, do as I say.

20 Years Ago in *73* ...

Donate

The question of ARRL finances seems to get murkier all the time. We see letters crying for donations and we read about the horrible losses they are sustaining with their staff, with few old-timers left and empty offices everywhere ... offices which were just recently built at enormous expense.

The donations for their WARC efforts are particularly difficult to justify. Noel Eaton testified before the manufacturers that they have over $600,000 available, if they wish to spend it. In addition to that rather tidy sum, I see by the latest Annual Report that they still have kept up their $100,000 fund for the defense of amateur frequencies ... and WARC would seem to qualify in this department.

Now, it is entirely possible that the League is intending to spend more than $750,000 at Geneva this year. If their performance at the last WARC in 1959 is any criterion, where League officials were flown over at League expense, even with their salaries being paid by the League, and for no more important function than to attend some lavish parties, then they might indeed run through the three-quarters of a million.

Will the League again have a lavish suite of rooms in one of the most expensive hotels in Geneva, all paid for by some 80,000 generous League members? The concept of Yankee thrift seems not to extend down to Connecticut. If you are sucker enough to eagerly send in your hard-earned money for these turkeys to enjoy themselves at your expense, so be it.

While on the one hand I keep hearing the moans of poverty from Newington, on the other I look at their recent balance sheet and find that their net worth increased last year by almost 10%. Most firms would count that as a profit, but the League, being "non-profit," shuffles the bookkeeping around and puts the funds into stocks and bonds (they have over $1.5 million sitting in securities).

The election of directors is coming up this fall and half of the directors are up for re-election. If you blindly return these chaps to office, then *you* must share in the responsibility for what is happening. With the exception of Don Miller, you have nothing to lose by turning the lot of them out. Darned few are active hams anyway ... they are politicians and they're using your money for gratifying their egos. With some new directors, you might have a chance of getting the entrenched clique kicked out of HQ and getting someone with business experience into the job.

I think every amateur really wants to be able to be proud of the ARRL and see it regain its leadership position. But we can't respect it when we see the double-talk and cover-ups ... and when we see everyone we've known at HQ for years getting the hell out ... except for Balwin and Dannals.

It is the responsibility of the directors to see that they have an HQ staff which will run the organization in the black. It is the responsibility of the members to see that they vote in directors who will run the organization and not be buffaloed by a couple of people at HQ. In the meanwhile, sending more money to the League will just encourage them to waste more ... like the government.

The League can make money so they will be able to do the jobs we expect them to ... such as get amateur radio established on a good footing in most of the Third World countries ... and put up a more intelligent battle against FCC rules which are harmful. To do this, they need someone running the place with some business background and, as far as I can see, they don't have it.

The ads in *QST* should bring in about $3 million per year ... and so should the memberships. Books should bring in another $1.5 million per year ... at least. With expenses around $5 million, that should leave a good supply of money for ARRL activities and lobbying.

Instructions for Making Superb Applesauce

First, cut up apples, removing the cores and any blemishes ... spots, bruises ... but leave on the skins. Cut apples into bite-size chunks.

Put in a large pot, perhaps four to eight quarts at a time, fill one-third to two-thirds full with water (depending on your consistency preference), cover, and bring to a boil. Boil about five minutes at most, and stir the apples now and then to make sure all are cooked about the same amount.

When the apples are fairly soft, turn off the heat and add about 1/2 cup of sugar for each quart of apples. This will vary some depending on the tartness of the apples. It is difficult to get an apple which is too tart for applesauce.... I've never found one. Stir in the sugar well and let it cool just a bit.

Spoon the 'sauce into plastic freezer containers, make with the type of apple and the date, and let them cool. Later you can freeze them with no loss of flavor.

I prefer Transparent apples by far, with the second choice being Duchess ... then Wealthy. Macintosh and McCoun are okay, but not nearly as great as the first. I had to plant my own trees just to get the type of applesauce I like.

Milder apples may need some lemon juice to add tart ... use it sparingly and taste as you go. Truly tame apples may even need some cinnamon.

This process of making applesauce is so infinitely better than anything available canned that you will never go back to store applesauce again. Even old, soft apples of the most bland type will make better 'sauce than the best canned stuff.

I often keep a lot of apples in the refrigerator so that I can cut up one or two to have for lunch with some Havarti or Jarlsberg cheese. Eventually these apples get a bit withered and soft ... so I then 'sauce them ... you can cut up a remarkable lot of apples while watching TV and not waste your time so totally. I save some videocassette movies for this process.

If you prefer canning yourself, this works fine, too. I like freezing because it is a lot simpler for applesauce and even for jams, too.

Hey, don't strain the 'sauce. The peels of the apples soften up when you cook them and have some of the best flavor. Some peels will give the 'sauce a nice red color.

You have to have your own tree for Transparent or Duchess, both very early apples. They don't last but a day or two when they ripen, so they are not useful for selling. When your Transparents start to get ripe, start shaking the tree every day and don't let 'em ripen all the way on the tree. My first apples this year were ready to eat in mid-July, which is incredible for New Hampshire. I think the Transparent and the Duchess are the finest apples in the world. 73

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The Bioelectrifier Handbook: This explains how to build or buy ($155) a little electrical gadget that can help clean the blood of any virus, microbe, parasite, fungus or yeast. The process was discovered by scientists at the Albert Einstein College of Medicine, quickly patented, and hushed up. It's curing AIDS, hepatitis C, and a bunch of other serious illnesses. The circuit can be built for under $20 from the instructions in the book. $10 (01)

The Secret Guide to Wisdom: This is a review of around a hundred books that will help you change your life. No, I don't sell these books. They're on a wide range of subjects and will help to make you a very interesting person. Wait'll you see some of the gems you've missed reading. $5 (02)

The Secret Guide to Wealth: Just as with health, you'll find that you have been brainwashed by "the system" into a pattern of life that will keep you from ever making much money and having the freedom to travel and do what you want. I explain how anyone can get a dream job with no college, no résumé, and even without any experience. I explain how you can get someone to happily pay you to learn what you need to know to start your own business. $5 (03)

The Secret Guide to Health: Yes, there really is a secret to regaining your health and adding 30 to 60 years of healthy living to your life. The answer is simple, but it means making some difficult lifestyle changes. Will you be skiing the slopes of Aspen with me when you're 90 or doddering around a nursing home? Or pushing up daisies? No, I'm not selling any health products. $5 (04)

My WWII Submarine Adventures: Yes, I spent from 1943-1945 on a submarine, right in the middle of the war with Japan. We almost got sunk several times, and twice I was in the right place at the right time to save the boat. What's it really like to be depth charged? And what's the daily life aboard a submarine like? How about the Amelia Earhart inside story?If you're near Mobile, please visit the Drum. $5 (10)

Travel Diaries: You can travel amazingly inexpensively – once you know the ropes.Enjoy Sherry and my budget visits to Europe, Russia, and a bunch of other interesting places. How about a first class flight to Munich, a rented Audi, driving to visit Vienna, Krakow in Poland (and the famous salt mines), Prague, back to Munich, and the first class flight home for two, all for under $1,000. Yes, when you know how you can travel inexpensively, and still stay in first class hotels. $5 (11)

Wayne's Caribbean Adventures: More budget travel stories – where I visit the hams and scuba dive most of the islands of the Caribbean. Like the special Liat fare which allowed us to visit 11 countries in 21 days, with me diving all but one of the islands, Guadeloupe, where the hams kept me too busy with parties. $5 (12)

Cold Fusion Overview: This is both a brief history of cold fusion, which I predict will be one of the largest industries in the world in the 21st century, plus a simple explanation of how and why it works. This new field is going to generate a whole new bunch of billionaires, just as the personal computer industry did. $5 (20)

Cold Fusion Journal: They laughed when I predicted the PC industry growth in 1975. PCs are now the third largest industry in the world. The cold fusion ground floor is still wide open, but then that might mean giving up watching ball games. Sample: $10 (22).

Julian Schwinger: A Nobel lauriate's talk about cold fusion— confirming its validity. $2 (24)

Improving State Government: Here are 24 ways that state governments can cut expenses enormously, while providing far better service. I explain how any government bureau or department can be gotten to cut it's expenses by at least 50% in three years and do it cooperatively and enthusiastically. I explain how, by applying a new technology, the state can make it possible to provide all needed services without having to levy *any* taxes at all! Read the book, run for your legislature, and let's get busy making this country work like its founders wanted it to. Don't leave this for "someone else" to do. $5 (30)

Mankind's Extinction Predictions: If any one of the experts who have written books predicting a soon-to-come catastrophe which will virtually wipe us all out are right, we're in trouble. In this book I explain about the various disaster scenarios, from Nostradamus, who says the poles will soon shift, wiping out 97% of mankind, to Sai Baba, who has recently warned his followers to get out of Japan and Australia before December 6th this year. The worst part of these predictions is the accuracy record of some of the experts. Will it be a pole shift, a new ice age, a massive solar flare, a comet or asteroid, a bioterrorist attack, or even Y2K? I'm getting ready, how about you? $5 (31)

Moondoggle: After reading René's book, *NASA Mooned America*, I read everything I could find on our Moon landings. I watched the videos, looked carefully at the photos, read the astronaut's biographies, and talked with some of my readers who worked for NASA. This book cites 25 good reasons I believe the whole Apollo program had to have been faked. $5 (30)

Classical Music Guide: A list of 100 CDs which will provide you with an outstanding collection of the finest classical music ever written. This is what you need to help you reduce stress. Classical music also raises youngster's IQs, helps plants grow faster, and will make you healthier. Just wait'll you hear some of Gotschalk's fabulous music! $5 (33)

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Code Tape (T20): Start right out at 20 wpm and master it in a weekend for your Extra Class license. $5 (43)

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The *73* Flea Market, Barter 'n' Buy, costs you peanuts (almost)—comes to 35 cents a word for individual (noncommercial!) ads and $1.00 a word for commercial ads. Don't plan on telling a long story. Use abbreviations, cram it in. But be honest. There are plenty of hams who love to fix things, so if it doesn't work, say so.

Make your list, count the words, including your call, address and phone number. Include a check or your credit card number and expiration. If you're placing a commercial ad, include an additional phone number, separate from your ad.

This is a monthly magazine, not a daily newspaper, so figure a couple months before the action starts; then be prepared. If you get too many calls, you priced it low. If you don't get many calls, too high.

So get busy. Blow the dust off, check everything out, make sure it still works right and maybe you can help make a ham newcomer or retired old timer happy with that rig you're not using now. Or you might get busy on your computer and put together a list of small gear/parts to send to those interested?

Send your ads and payment to: *73 Magazine*, Barter 'n' Buy, 70 Hancock Rd., Peterborough NH 03458 and get set for the phone calls. The deadline for the February 2000 classified ad section is December 10, 1999.

President Clinton probably doesn't have a copy of *Tormet's Electronics Bench Reference* but you should. Check it out at **[www.ohio.net/~rtormet/index.htm]**—over 100 pages of circuits, tables, RF design information, sources, etc. BNB530

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Updates

"PIC Key, PIC Key" (Sept. 1999, p. 10ff.)

Our thanks to Professor Lynden McIntyre N8RXL of Sinclair Community College in Dayton, and others, for pointing out the following oversights in the Table 1 assembly language listing on page 12.

1. Line 2: LIST P=16F84 should be in the second column, not first.

2. Line 3 _ _ CONFIG 0X3FF3; RC CLOCK OSCILLATOR should be in second column, not first. Also, it should begin with two distinct underscores (between which we have put a space here for emphasis).

3. Under "CPU equates", there should be a new line inserted under "count2": COUNT3 EQU 0X0E ;FOR DASH DELAY

4. Also under "CPU equates", both "mov1w" listings should be replaced by "MOVLW".

5. Also under "CPU equates", listings "tris porta" and "tris portb" should be respectively replaced by "MOVWF TRISA" and "MOVWF TRISB". (These suggestions are made by the 16F84 data sheets, and have not been verified as we go to press.)

6. Under comments for both "DOT" and "DASH", the spelling should be "subroutine," not "subrouting."

7. Under "subroutine DOT", "subroutine DASH", and "subroutine PAUSE": "MOVLW", not "mov1w".

8. Also, "subroutine PAUSE" should contain "D '13'", not "d '14'".

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13. COMPUTER INTERFACE • Built-in RS-232C interface for advanced computer applications.
14. ERGONOMIC LAYOUT • Front panel features easy to read color LCD display and thoughtful placement of controls for ease of operation.
15. HEAVY-DUTY POWER SUPPLY • Built-in switching power supply with "silent" cooling system designed for continuous transmission at maximim output.

JRC *Japan Radio Co., Ltd.*

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CIRCLE 159 ON READER SERVICE CARD

The New Approach to HF Radio!

The Kachina 505DSP Computer Controlled Transceiver

Features:

- Works with any Computer Running Windows 3.1, 95 or NT
- Covers all Amateur HF Bands plus General Coverage Receiver
- IF Stage 16/24 Bit Digital Signal Processing (DSP)
- II DSP Bandpass Filter Widths from 100 Hz to 3.5 kHz (6 kHz in AM Mode)
- Band Activity Display with "Point and Click" Frequency Tuning
- On-screen Antenna "Smith" Chart, Logging Software and Help Menus
- Automatic Frequency Calibration from WWV or Other External Standard
- "Snapshot" Keys for Instant Recall of Frequencies and Settings
- Optional Internal Antenna Tuner

The Kachina 505DSP Computer Controlled HF Transceiver After twenty years of building commercial transceivers in Arizona, Kachina has decided the time is right for a new approach to amateur radio. The Kachina 505DSP is nothing short of a revolution in HF transceivers.

Why Use Knobs if You Have Windows? The old-fashioned front panel has become too cluttered to be useful. Too many knobs, too many buttons. Kachina's 505DSP transceiver connects to your computer's serial port and is completely controlled under Windows™. With optional cables, the radio may be remotely located up to 75 feet away from your computer. Imagine combining a state-of-the-art DSP transceiver with the processing power and graphics capabilities of your PC and you'll soon wonder why all radios aren't designed this way. Why settle for a tiny LCD display when your computer monitor can simultaneously show band activity, antenna impedance, heat sink temperature, SWR, forward and/or reflected power and a host of other information?

16/24 Bit DSP/DDS Performance In addition to 100% computer control, the Kachina 505DSP offers exceptional 16/24 bit DSP/DDS performance. IF stage DSP, "brick-wall" digital filtering, adaptive notch filters and digital noise reduction, combined with low in-band IMD and high signal-to-noise ratio, produce an excellent sounding receiver. Sophisticated DSP technology achieves performance levels unimaginable in the analog world. The transmitter also benefits from precise 16/24 bit processing. Excellent carrier and opposite-sideband suppression is obtained using superior phasing-method algorithms. The RF compressor will add *lots* of punch to your transmitted signal without adding lots of bandwidth, and the TX equalizer will allow you to tailor your transmitted audio for more highs or lows.

Seeing is Believing American-made and designed, and able to stand on its own against the world's best, the 505DSP is bound to set the standard for all that follow. But don't take our word for it. Visit our website at http://www.kachina-az.com for detailed specifications, to download a demo version of our control software, or to see a current list of Kachina dealers displaying demonstration models in their showrooms.

KACHINA COMMUNICATIONS, INC.

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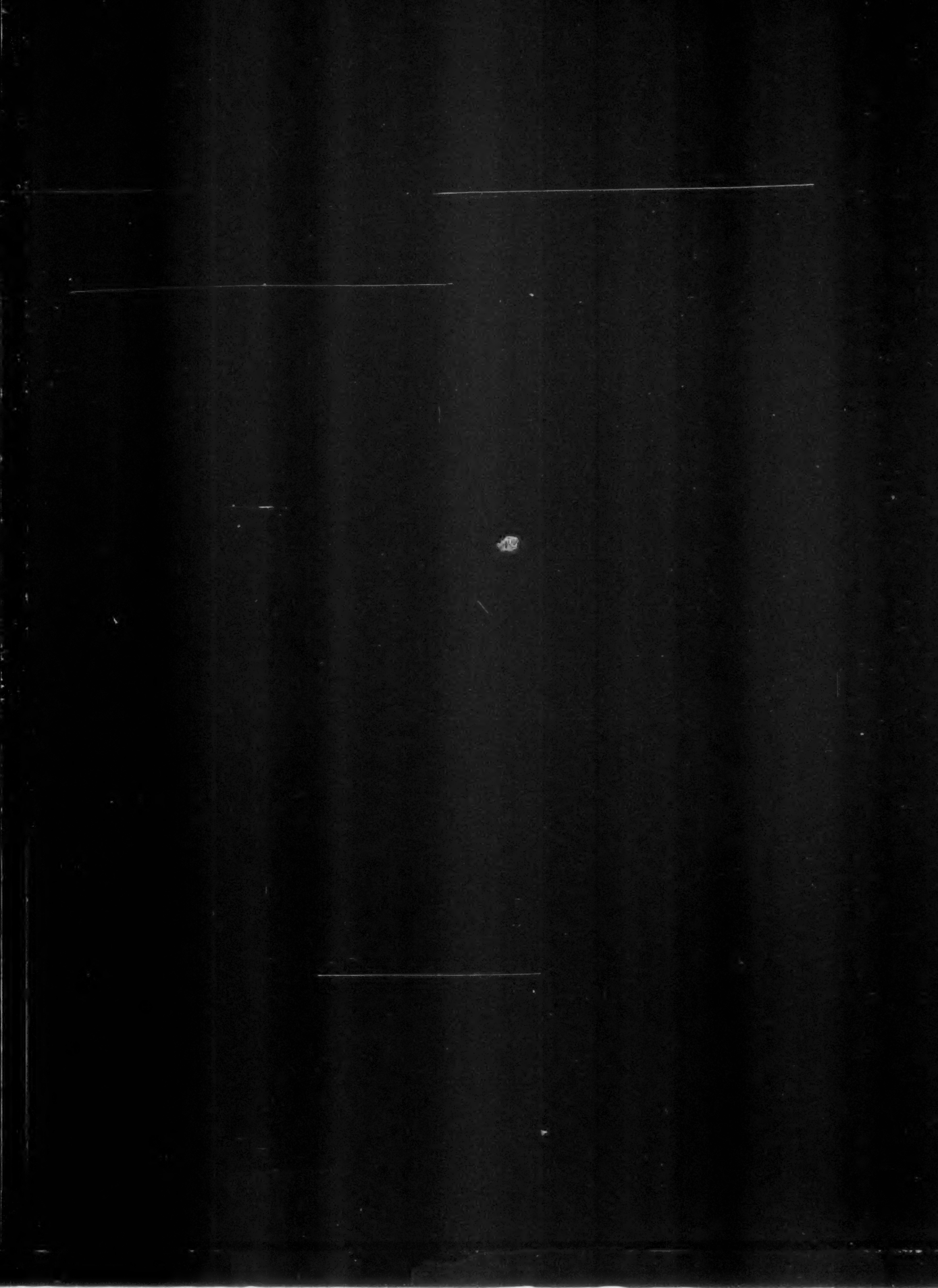
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